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FIRE insurance people might now easily launch a new saw that would acquire as much currency as that old saw, "It never rains but it pours."

COTTON prices were such before the late awful slump as to leave much money in the South. Then with $30,000,000 of fire insurance money going to Baltimore, the building fraternity down in those parts cannot be looking for a dull year.

THE amended Chicago building ordinance governing the construction and management of theaters makes it the duty of the building commissioner, the fire marshal or the superintendent of police to order any theater to be closed when it is discovered that there is any violation of the provisions of the ordinance. And if either of the above officials reports to the mayor that any theatrical manager has violated or refused to comply with the ordinance when ordered, it becomes the duty of the mayor to close such theater and revoke its license. Lack of authority can hardly be pleaded by officials after this. Locating responsibility may not be so easy, however.

BUILDING hardware manufacturers have come to an understanding whereby all the designs of all of them have been classified and priced. It is said that cheap goods are not much affected at present, but that the better goods are to be advanced from 25 to 50 per cent at once, and that a 10 per cent advance on all goods is slated for the near future. How much more the combine will be able to assess the consumer, or how much it can reduce wages before it falls to pieces, remains to be seen.

BALTIMORE and Rochester are already furnishing ammunition for renewed warfare between fireproofing systems. The Baltimore experience is being pointed to with pride by adherents of orthodoxy in fireproofing, for there skyscrapers had such a test as they are not likely to have in a generation again. A big skyscraper used for offices becomes a storehouse of an immense lot of combustibles. When the building is attacked from without by such heat as to drive away the occupants and ignite the contents, the structure is put to a far sterner test than could be possible from a fire beginning within the building. Yet steel frame and terra-cotta covering have passed through just such an ordeal with honor.

THE weather has been of such strenuous sort as to make the winter memorable even to those who have had the means to provide fuel. It has also rendered the higher latitudes unsafe for that most "ornary" of all the sons of Annanias who was forever telling how he "het" his house of twelve rooms with four tons of coal for the winter, and as a matter of course all parts of it were uniformly warm. This particular lie was for some reason, which no one can explain, as similar in the mouths of its many votaries as is the call for a cracker among parrots in cages. The experiences of the winter will promote building to save heat. Hollow building blocks that have been finding their way into the market, both in burnt clay and in cement, will be more easily sold than if the winter had been at all reasonable. By the way, it would be of great assistance to people who are really investigating the relative merits of hollow terra-cotta and hollow concrete blocks as heat savers if some careful and intelligent tests of the relative conductivity of the materials could be made—something as conclusive as the tests made at the "Tech" by Prof. Ordway early in the '90s to show the relative value as heat savers of different materials and arrangements of materials used in covering pipes.

The first annual exhibition under the auspices of the Minnesota State Art Society will be held at the library building at St. Cloud from Monday, April 4, to Saturday, April 16, 1904. Mr. Robert Koehler, of Minneapolis, is president, and Mrs. W. E. Thompson, of St. Paul, is secretary of the society. A considerable list of prizes is offered, and the society offers its services in effecting sales. Mr. Robert Koehler, 4816 Portland avenue, Minneapolis, is chairman of the exhibition committee.

In view of the order of the Minnesota State Board of Health that municipalities shall not pollute streams with sewage after 1905, the figures of a small venture in purifying sewage become interesting. There are perhaps a dozen small places scattered about the Northwest, more in Wisconsin than elsewhere, now doing something in the way of sewage purification. The Madison experiment is perhaps the most instructive of these. Some time since it contracted for a chemical plant with a capacity of 12,000,000 gallons daily, and guaranteed to take care of 600,000 gallons daily, at a cost of operating not to exceed $3,600 annually. The cost proved to be $7,360 per annum, after deducting cost of pumping, and $3,400 of this was for chemicals. Besides this the filters gradually clogged and the work is reported not very satisfactory generally.

Septic tanks were substituted, while in place of the three polarite filters with a combined area of one-eighth acre, seven filter beds of a total area of an acre, made up with screened cinders, supplied and drained in the way that is now the vogue, were used. These are each flooded one half hour at a time. The septic tank was divided in halves so that a part might be cleaned without stopping the operation of the plant. During the barely perceptible flow through the tank, anerobic action of bacteria is so efficient as to destroy 90 to 95 per cent of the solids in solution, and change at least one-half of the albuminoid ammonia into harmless compounds. So small a percentage of the solids carried by the sewage is precipitated that this tank at Madison ran sixteen months without cleaning, handling from 600,000 to 900,000 gallons daily, and was cleaned at a cost of $62.

The cost of operating the plant for one year was $4,600 including pumping. This pumping cost, when the chemical method was in use, was $3,060, and probably somewhat more after the change as more sewage was handled.

The septic tank seems, therefore, not only to avoid the cost of chemicals, but to be cheaper in operating in other ways and decidedly more efficient, when properly supplemented with filters. In fact, if the health and wishes of fishes are to be taken into account, it is told that the effluent from the septic tank and filter beds agree with them better than that from the chemical methods. The current value of this statement might have been enhanced by the assurance that the tests were not made on any member of the sucker family. The success of Madison and several other small places is a very good argument for the attitude of the board of health in ordering the pollution of streams stopped, so far as it may apply to small towns, but it is not at all clear how the methods applied at Madison and elsewhere can be applied to the large towns whose sewers carry all sorts of waste at all times and enormous quantities of water and street washings during storms.

Mr. Parry, the emancipator, who lately undertook to free the working class from the tyranny of the unions, is reported as having a strike in his Indianapolis shops; his non-union, unorganized employes, finding themselves of one mind after a series of cuts in wages, amounting to some 25 per cent in six months.

Combinations of manufacturers and others to control trade have been so much the rule of late years, and the cost to the consumer of these monopolistic attempts has been so great that he has had little time to classify them. The average consumer has been obliged to "hustle" so for these combines, that he is not yet half conscious that only part of them have the solid basis of some special legal privilege, or perhaps corrupt transportation contract, upon which to build their monopoly, while the others can only maintain their ascendency by furnishing superior wares and judicious advertising. Instances are becoming plentiful of the failure of would-be monopolies lacking the foundation of special privilege, who have failed for want of public confidence in their output.

Combinations of workmen to monopolize employment in various lines have meanwhile been managed much in the same way as have those of employers, and they have been often reproached with doing nothing to elevate the standard of workmanship, but on the contrary, of seeking to make the performance of the least skillful the standard for all. That such a course is the logical tendency of monopoly adds much force to the accusation. The tendency is not universal, however, as movements are on foot among unions at several points in the country looking towards better training for young men before they will be accepted as members.

This journal has been honored with a request that a member of its staff counsel with representatives of a prominent local building trade as to the best and most feasible way of establishing a sort of trade school for young men wishing to learn this trade. The course will include mechanical drawing as well as the theory and practice of the craft, and it will be made popular by the fact that young men will have to be provided with a certificate of efficiency before they will be admitted to the unions. This movement will at once bring the heartiest support from architects and contractors, both of whom are constant sufferers from the lack of knowledge of drawing among workmen. Young men with such privileges will stand much better chances of becoming foremen, and will, in the course of study, get much of the equipment necessary to contractors.

THE special grand jury having the Iroquois theater disaster under consideration failed to find evidence that the mayor had been personally notified of the violations of the law by the management, but they returned indictments against the commissioner of buildings and an inspector for malfeasance in office, and they are held to be directly accountable for the lack of protection in the theater. The senior manager, the business manager and the stage carpenter are each charged with manslaughter. In the absence of any synopsis of the law and the evidence, it would be folly to comment upon this action by the grand jury, but at a passing glance the effect of holding somebody responsible appears wholesome.

Conditions brought to light by examinations of audience rooms in all parts of the country confirm the opinion already expressed in this department, that the planning and construction of such buildings is of much less moment than their subsequent management. Whether or not existing laws in Chicago were such as to throw so much responsibility upon the building inspection department, as indicated by the report of the grand jury, will be shown by the trials of the indicted officials. If the Chicago code did centralize and locate responsibility to such extent, it is certainly exceptional and may well be copied by other cities.

In the general housecleaning all over the country that followed the Chicago disaster, conditions have been revealed of which the public has been kept in ignorance. Daily papers would not publish details, and although the authorities were in position to do a good deal by something very like "bluffing," they have had no real backing by daily papers, to whom theaters are so favorably known through advertising departments. It is probable that in most cases, had attempts to enforce changes in arrangement and management been taken to the courts, authority would have been found wanting. Of course, managers would have generally shunned the publicity of a suit to enforce an order to do this or that of the things well recognized as pertaining to good management, but that they could legally be compelled to make proper provisions for the safety of audiences is not true in very many cases.

For fear of confusing issues, and at some risk of being accused of indifference upon the subject, this department has avoided the discussion of theater ordinances in whole or in part. We have done this because, human nature being what it is, the arrangement and construction of theaters is an insignificant feature of the large question of the safety of theater-goers. The Iroquois disaster is sufficient proof of this. Build a dozen theaters as well as you know how, and place them in charge of a dozen different managers, and it will not be five years before ten of them will be found ranging from dangerous to very dangerous. About the only feature of importance in the whole question is that of intelligent and responsible inspection. Is any city preparing to secure this? It is as good as certain that the Iroquois disaster will result in an overhauling of building codes all over the country, but we venture to say that the cases where these codes will be backed up by a working system of continuing responsible inspection will be rare. No system in which one official may shift responsibility to another, or in which it lays between officials of different grade in the same department, will answer.

PHILADELPHIA is still making big bids for the honor of being the home of what used to be called the new science in Keeley's time, if we remember rightly. The Franklin Institute has lately been addressed by a discoverer, a Mr. Outerbridge, who has found that cast iron by repeated heatings and coolings can be made to grow one-eighth in its measurements. The Boston technical journal, which devotes goodly space to reporting this discovery, does not say how many heatings nor what degree of heat must be applied to accomplish this, but the experimenter must have been persistent if he repeated the heatings more times than falls to the experience of the grate of a house heater. Let us assume then a house hot water heater, with a grate 24 inches in diameter, which is fired up 500 times before being "burnt out." That it does finally burn out indicates that the limit of its endurance has been reached and that it has endured more serious heatings than Mr. Outerbridge's specimens. Now, the householder, having burned out this old grate, replaces it with a new one cast from the same pattern, and finds no difficulty with the fit; showing that whatever may be the effect of repeated heatings upon the grate, there has been no change in the diameter of the water protected fire-pot. That has not grown by repeated fires. And let us hope that the householder and the manufacturer may live long and die in ignorance of this Outerbridge discovery, that neither of them will have to worry because of the three-inch increase in diameter that came to the old grate during its service and which made no trouble in all those years.

NOWHERE else do we find people so busy throwing discredit on the old saying that there is nothing new under the sun as in the scientific column of a great local daily. Scarcely had it proved by abundant witnesses that a paste of water and ashes forms a very good fuel for house heating—one man had heated his house for several days with nothing else—when a new process of brick-making, discovered in the Black Hills, found its way into print. These bricks, which numerous tests show to be of superior quality, are made from the "sand of Whitewood Creek," into which a small quantity of lime is "mixed mechanically." This mixture is then subjected to "enormous pressure" and placed on cars holding "one thousand bricks each." Several of these cars are shoved into a "hardening cylinder" and steamed for from six to twelve hours "under a pressure of 120 pounds to the square inch." When withdrawn they are "ready for immediate use;" indeed one would hardly expect them to be as fit at any subsequent time. A firm of building contractors used to operate out that way of whom it was told that one would stay by the completed building and hold it up while the other went to the owner and drew the pay. Such partnerships might flourish again if these bricks sell well for a while.

NOTE—By an error in Mr. Overmire's article in our last issue the closing lines were ascribed to Mrs. Hemans, when they should have been credited to Longfellow.

The third line from bottom of page 20 crept in through fault of printers in making up.

RECOLLECTIONS OF BOSTON.

BY E. P. OVERMIRE.

Part Second—Boston Common.

Boston, like most large cities, has numerous breathing places, or squares, around which both buildings and associations cluster, making it an easy matter to subdivide the city, and thus handle with comparative ease a description of the more interesting spots that go to make up the city as a whole.

In taking these up, one would naturally, inevitably, begin with the old "Common," which is the most hallowed by time and associations, and the most jealously beloved and guarded of all Boston's parks. Numerous efforts to plant public buildings here, or in the adjacent Public Garden, have been thwarted, and it is to be hoped will always meet with a similar fate.

THE PUBLIC GARDEN, FROM ARLINGTON AND BOYLSTON STS.

The old "Common" was originally at the edge of the town, the Public Garden having been formed by the opening of Charles street in 1804, although not finally so designated until 1859, after much effort to turn it to less worthy purposes. The Common and Garden are inseparably associated, although the latter is comparatively modern in its layout and adornment. The Common is a kite-shaped plot of ground of about 48 or 50 acres, with Beacon street to the north, Tremont street to the east, Park street at the foot of the kite and Boylston and Charles streets at the south, forming the head of the kite. The Public Garden is a parallelogram of about twenty-one acres, its center being a very picturesque lake, or pond, with a foot-bridge at its narrowest part, leading from the Common to Commonwealth avenue. While the Garden is comparatively level, the Common has a very decided elevation along the Beacon and Charles street sides.

The historic frog-pond, of which every American schoolboy has read, is sacredly preserved with stone and cement, and is a favorite resort in nice weather

THE PUBLIC GARDEN, FROM BEACON AND CHARLES STS.

for small boys and their sail-boats. A good-sized deer-park and the old Central Burying-ground occupy a part of the side towards Boylston street, and there are several monuments in different parts: The large Army and Navy monument, in memory of the Civil War; the Crispus Attucks monument, commemorating the Boston massacre; the Brewer Fountain, and the monument to Col. Robert Gould Shaw and his regiment of colored soldiers, the latter being a comparatively recent addition. It faces the State-House, and the sculptor was Augustus Saint Gaudens, and the architect, Mr. McKim. Views of some of these monuments and two general views of the Common and Garden are given herewith.

TREMONT STREET MALL, SHOWING PARK STREET CHURCH.

Many historic buildings line this large park. At the juncture of Park and Tremont streets is the old Park

PARK SQUARE.

DICKERMAN BUILDING, ST. PAUL, MINN.
A. F. Gauger, Architect, St. Paul.

A SKETCH by the late HARVEY ELLIS.
J. W. Stevens, Architect, St. Paul, Minn.

THISTLE MOTIF

THISTLE MOTIF

USED IN ALL CARVING AND DECORATIONS, RESIDENCE OF JAMES A. PATTEN, EVANSTON, ILL.
George W. Maher, Architect, Chicago, Ill.

BREAKFAST ROOM, RESIDENCE OF JAMES A. PATTEN, EVANSTON, ILL.
George W. Maher, Architect, Chicago, Ill.

DINING ROOM, RESIDENCE OF JAMES A. PATTEN, EVANSTON, ILL.
George W. Maher, Architect, Chicago, Ill.

CARRIAGE ENTRANCE TO HALL, RESIDENCE OF JAMES A. PATTEN, EVANSTON, Ill.
George W. Maher, Architect, Chicago, Ill.

DINING ROOM, RESIDENCE OF JAMES A. PATTEN, EVANSTON, ILL.
George W. Maher, Architect, Chicago, Ill.

MUSIC ROOM, RESIDENCE OF JAMES A. PATTEN, EVANSTON, ILL.
George W. Maher, Architect, Chicago, Ill.

ENTRANCE TO MUSIC ROOM, RESIDENCE OF JAMES A. PATTEN, EVANSTON, ILL.
George W. Maher Architect, Chicago, Ill.

SPIRIT OF THE THISTLE, RESIDENCE OF JAMES A. PATTEN, EVANSTON, ILL.
George W. Maher, Architect, Chicago, Ill.

RECEPTION ROOM, RESIDENCE OF JAMES A. PATTEN, EVANSTON, ILL.
George W. Maher, Architect, Chicago, Ill.

FRONT ENTRANCE, RESIDENCE OF JAMES A. PATTEN, EVANSTON, ILL.
George W. Maher, Architect, Chicago, Ill.

FENCE AND ENTRANCE FROM RIDGE AVENUE, RESIDENCE OF JAMES A. PATTEN, EVANSTON, ILL.
George W. Maher, Architect, Chicago, Ill.

VIEW OF THE FRONT, RESIDENCE OF JAMES A. PATTEN, EVANSTON, ILL.
George W. Maher, Architect, Chicago, Ill.

PERSPECTIVE SKETCH OF JAIL AND SHERIFF'S RESIDENCE FOR STUTSMAN CO., JAMESTOWN, NO. DAK.
E. J. Donohue, Architect, St. Paul, Minn.

DESIGN FOR LAKE COTTAGE.
Bertrand & Chamberlin, Architects, Minneapolis, Minn.

Street Church, whose demolition is now seriously proposed, and opposed, with the Granary Burying-ground adjacent. Opposite this church is Hamilton Place, leading to the old Boston Music Hall. On Tremont street on the east side of the Common, is old St. Paul's Church; on Boylston street, near Tremont, was the old Public Library now removed to Copley Square and replaced by the magnificent "Colonial" office and theater building. Farther along Boylston street comes Park Square, where the Old Providence Station stands, also the statue of "Lincoln Freeing the Slave." At Arlington and Boylston streets, is the old Unitarian

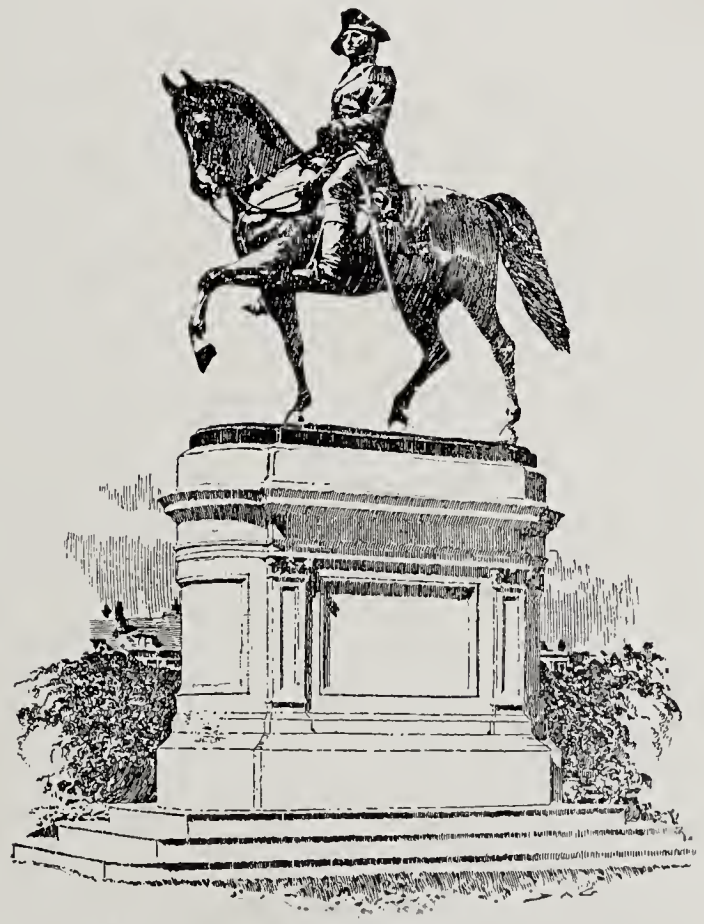
Church, where Dr. Brooke Herford preached for so many years. On Arlington street, on the axis of the Public Garden, opens Commonwealth avenue, one of the impressive fashionable residence streets of the world, and along the north side of this runs old Beacon street, famous as a fashionable and exclusive residence thoroughfare. On this street lived John Hancock, Wendell Phillips, Wm. H. Prescott, the historian,

THE BREWER FOUNTAIN AND STATE HOUSE.

Julia Ward Howe, Oliver Wendell Holmes, the Appletons, and many others of the old aristocracy. The Somerset Club occupies the old Sears mansion, and at the corner of Beacon and Park stood the old Ticknor mansion, now an office-building. It was the writer's

THE APPLETON HOUSE, 54 BEACON STREET, BOSTON.

great pleasure to have been in the office of Mr. McKim, at No. 53 Beacon street, while the new Public Library was under way, a most delightful place for work and study within easy reach of Copley Square, and in a most quiet and favorable environment.

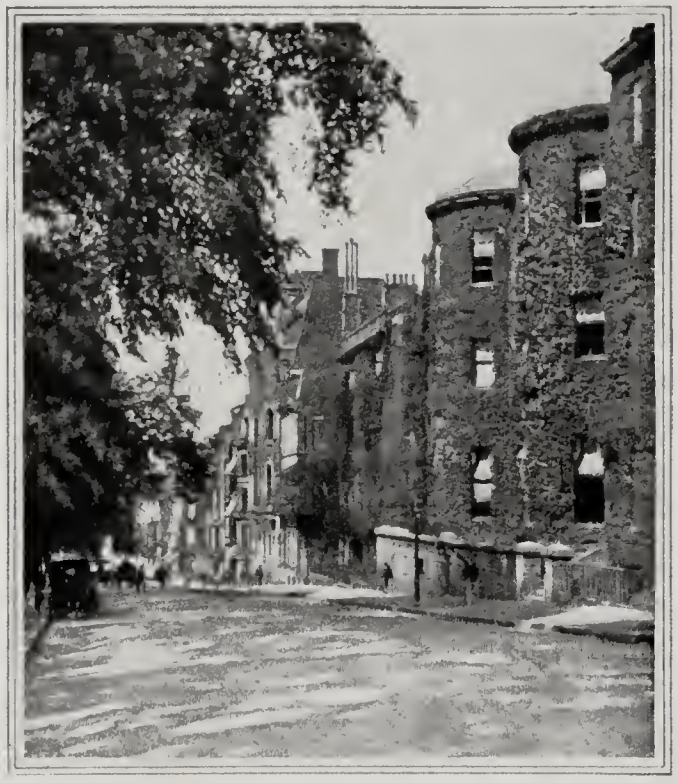


George Washington. Bronze. Public Garden, Boston, Mass.
Thomas Ball, Sculptor, 1869.

In the Public Garden are a number of monuments, those to General Washington and Dr. Morton, the discoverer of anesthetics, being the most prominent and best remembered. Both the Garden and the Common now contain stations of the underground railway, without which the enormous suburban traffic problem

could not have been adequately handled. This is the nearest approach to desecration of these old parks that has been permitted thus far.

On Beacon street, midway between Park and Tremont, formerly stood the old Atheneum, since crowded



BEACON STREET SHOWING SOMERSET CLUB AT THE RIGHT.

out to the Back-Bay district, and replaced by a modern office-building. This old building opened onto the Granary Burying-ground, thus affording in the very heart of Boston a most retired and pleasant retreat for the old book-worms and students, who loved above all things a quiet place and a congenial poet, or author, for their hours of meditation.

At the corner of Beacon and Park stood the old Ticknor mansion, now a resort for artists and architects, among whom were Miss Josephine Chapman

ON BEACON STREET.

Wright, Boston's female architect, and next door was the office of Edwin J. Lewis, the genial secretary of the Boston Society of Architects.

The extension of the State-House was a deplorable necessity and only the strenuous opposition of the Historical Society and other interested parties prevented the alteration of the front of this venerable building, which would have assuredly been a great calamity.

THE ROBERT GOULD SHAW MEMORIAL.

Boston Common has ever been the people's forum where the patriot, the politician, and the preacher have always found appreciative audiences. It was here that the famous Jesse Lee preached the doctrines of Methodism at a time when there was no church open to him. A tree was planted to his memory on the spot where he preached, by the Methodist people while the writer was there. At times, like the glorious Fourth, Washington's birthday, Decoration Day, etc., one can always find things moving here, most of the old-timers recalling some lively experiences in connection with Boston Common. Having crossed it daily for several years, the writer feels qualified to join to some extent with the host who have naught but praises and patriotism for old "Boston Common."

PHOTOGRAPHING ARCHITECTURE.

In Three Parts—Part Two.

In tripod work, there are really few occasions when one needs a shutter for photographing architecture. Cap exposures may be made in one-half second or less, and although this interval exposes one to too much risk of jarring the camera in windy days, there is some compensation in the greater convenience of the cap for all indoor work. However, as everyone believes he should have a shutter, there are a few things to note in selecting one. As a rule avoid those in which diaphragm and shutter are combined, the leaves of the iris opening and closing to make the exposure. These admit less light during a given short exposure than do such as have shutter and diaphragm separate. They are also quite too complicated as a rule. Of late, makers have placed on the market diaphragm shutters which are claimed to consume but a small fraction of the time of the exposure in opening and closing, and for long exposures they are seen to do this, but it is to be feared that they cannot apply the principle to very short exposures.

Some very simple shutters are probably really more serviceable for architectural work than any having the time index. A shutter that will give a reliable instantaneous exposure of say 1-25 sec., with another controlled by the bulb and another requiring 2 pressures for a time exposure, will be better for architectural work than anything more complex. The exposure of 1-25 sec. will be short enough for people walking, while the bulb exposure can be made in about ¼ sec. Of course such speeds would be of little use in recording sporting events, such, for instance as the action of a fast trotting horse, which sometimes makes over 40 ft. per second. For such work, no lens shutter is suitable.

Shutters are sometimes made in which it is attempted to overcome the tendency to under-exposure of foregrounds in quick exposures out of doors. Very little can be done in this direction without going to such an extreme in the shape of the blades of the shutter as to make it undesirable for all around work. However, in making cap exposures out of doors it is well to make it a practice to raise the cap over the lens.

It sometimes happens that this tendency of backgrounds to over-expose may be remedied to a degree in the development, by tilting the tray so as to stop the action of the solution on the sky and roofs before the foreground is completed. Not all pictures are so composed as to admit of this, but one should always take adavntage of such a chance when it offers.

A rough and fairly accurate test of the speed of a shutter at moderately short exposures may be made, if enough is at stake. Suppose a buggy axle to be propped up and the wheel to be whirled at a rate of say one revolution per second. Suppose the rim to be say 10 ft. in circumference and to have a white band one inch broad fastened to it. Place the camera where the image of the wheel on the plate will be large enough to measure the distance traveled by the white band on the dry-plate. After exposing and developing, if the image of the moving band were to show say 1-30 of the circumference of the wheel, or 4 inches by the scale of the photograph, then the band will really have traveled 3 inches, showing that the exposure lasted 1-40 second.

The emulsions of modern dry-plates are fairly successful in retaining color values of building materials; indeed the use of the color-sensitive plates and ray-filter appears at times to overdo things in the effort to retain color values. Dark-colored materials of crystalline nature like some sand-stones give unnatural effects, but as a rule to get the best results one must rely on suitable lighting.

The color-sensitive plates and ray-filter may be of use in getting a better general effect in out-of-door work, and there may be occasions when the element of light-blue is sufficiently marked in the object to be photographed to demand the use of these plates. If used, they should be handled with the greatest care until developed and cleared, as they are more easily fogged than other plates.

Emulsions on commercial dry-plates and the quick developing papers (bromides), used for enlargements, as well as on the very slow developing papers (Cyko, Velox, etc.), have this in common, that no great uniformity has ever been maintained by makers in the quality of sensitiveness to light. With dry-plates or films for out-of-door work, between variableness of light and shutters, one can but guess at the sensitiveness of a given emulsion, but when one tries different emulsions of a given brand at such slow work as copying or lantern-slide printing, he finds, as he does with printing bromide papers, that they are far from uniform in sensitiveness.

With the papers, and to a considerable extent with the plate emulsions, the slower work "harder," (more contrasty), and the quicker are "softer."

As a rule it is not advisable to use very quick plates on building work, but after making the negative, if one is to attain the best results, he must use a paper for the print that will make the most of the negative. For purposes of reproduction, if the negative be fairly vigorous, none of the commercial papers are better suited than the glossy printing-out sorts such as "Kloro," "So-

lio," etc. The old-time albumen papers probably give a better quality of shadow but can hardly be had now.

Of the bromide papers, the very quick sorts used for enlargements may be used for contact printing with good results, but must be handled as carefully as dry-plates to prevent fogging. One of these, a very rough, buff-tinted paper, selling under the trade name of Royal Bromide may be used with great success for certain effects. There seems to be hardly any limit to the keeping qualities of this paper.

Sometimes a negative and print must be had without the delays incident to the common course of events. There is no time to dry a negative, to say nothing of making a daylight print. This is a time that it is good to have bromide paper. Develop and fix the negative, wash it more or less and while wet gently press on the emulsion side a thoroughly wet piece of bromide paper. Expose as for bromide print—except that the same paper and negative would expose in much less time if dry—develop, fix and wash the print. Probably the washing need not be thorough to enable it to keep long enough for its purpose. In this way a print may be obtained mounted and dried in as little time after reaching the dark room with the exposed dry-plate as commonly lapses between the developing and drying of a negative.

In exposing for printing, it is necessary, both for papers and for lantern-slide plates to expose just right and to develop fully. It is not practicable, here, as in developing the negative, to stop development of an over-exposure at the proper time, but the development must be allowed to proceed as far as it will. In this kind of printing there are constant failures from over-exposure until one becomes accustomed to the cause, which lies in the fact that the high-lights may be retained long after the shadows and low lights are so over-printed as to lose all character.

In contrast to this, a negative may be too weak from over-exposure, yet within limits that will admit of its being brought up by intensification to a point altogether satisfactory.

Intensification of the negative is a process of great value, for reclaiming over-exposed plates not only, but for helping out portions of plates. Often a negative, in whole or in part falls just a little short of what it should be, and it may be partially intensified,—enough to add all the strength possible to the low lights while adding but a trifle to the high lights that may be already sufficient.

Reference was made above to the trick of favoring the foreground in developing. Often when one has one of these badly-balanced negatives wherein the foreground is under-exposed, a local intensification will do much to set things to rights.

Some idea of the value of the process of intensification may be judged from the following: A film negative came to this journal taken from a foreign monument which it was very desirable to publish. Prints from this negative in the state that it arrived would be worthless because of the lack of contrasts, the film having been greatly over-exposed. Intensification of the film left it still too weak for use with any known paper; so the intensified film was used to make a contact print on a dry-plate with lantern-slide emulsion, and this positive was also intensified. From this a negative was made by contact which could hardly be criticised, and a print from this retained in a surprising degree the qualites of a print from an original good negative, it was quite free from all that characterizes prints from negatives made from paper prints.

The reverse process of reduction is much more difficult, for an amount of reduction needed by the high lights is apt to remove the low lights altogther.

Coming again to papers, it may be said that as a rule the amateur will have more trouble with the "printing-out papers"—those that are printed in by daylight and then "toned and fixed"—than with the platinum and bromide papers, and that prints of the former are less likely to keep than either of the latter. Prints on the glossy printing-out papers will retain fine details as well perhaps as any paper, when toned with a gold solution, but the amateur had better pass the "matt" surface papers and "platinite" toning of this class. Good "platinotype" papers are however most desirable in the rougher surfaces, are easily worked, and very permanent. "Platinum" or "platinotype" prints from good negatives may be made that fall very little short of "a joy forever." There are glossy bromide papers which may be used to preserve fine detail if one cannot wait for daylight. One of these of the slow-sort, known as "glossy velox," will often make a surprisingly strong print from a weak negative, but these prints are plagued with mysterious markings on the surface which the makers lay to "abrasion." This is often so bad that one may need to make several prints to get one good one. Slight marks of this kind may sometimes be washed off, and it is said that a weak solution of red prussiate of potash may be used, in much the same way as for the reduction of negatives, with the result of cleaning off these marks.

(To Be Continued.)

A contractor with very large experience in Portland cement work, particularly in the making of walks and floors, asserts that he has never used any mixture of cement and sand for such purposes that has not been notably improved in wearing qualities by the addition of black color. Nor has he ever taken up work where black and gray tiles alternated in which the gray tiles were not inferior. When Mr. J. C. Plant finished the Phoenix building in Minneapolis with Portland cement tile floors in corridors and offices, the idea was so new as to be classed with the experiments. Red and gray tiles were used, and the difference in the two is very noticeable at present, and all in favor of the colored tiles. Lampblack is generally used for coloring these tiles black, and in the absence of experience one would not predict advantage to come from its use, but so much evidence in favor of the colored tiles must be taken as conclusive.

FIREPROOF CONSTRUCTION STOOD THE TEST.

The faith of the people in fireproof construction has not been misplaced, evidence of which is to be found in the investigation of experts into the recent disaster in Baltimore. It is interesting to note that Chicago experts who have visited that city for the purpose of investigating the stability of steel construction have returned and have by their reports strengthened the high favor in which fireproof materials have always been held. In this connection it is worth while to quote the exact expressions of Manager H. H. Gliden, of the Chicago Underwriters' Association, who returned from Baltimore a few days ago, having been sent there by the Association to make an investigation of the conditions following the fire. He said: "All the steel structure of the fireproof buildings is standing intact, with the exception of probably a beam or girder here and there. The structure stands plumb with few exceptions and none of it is over an inch and a half out of line. As regards the covering of the steel work, it was found that brick survived the fire the best, and following that the best quality of tile. All stone work, the poorer tile, and granite have crumbled. Underwriters are viewing the Baltimore loss purely as the result of fire, as naturally there was but little water thrown. There were three sprinkled buildings destroyed, but it is impossible to tell what the effect of the sprinklers was and whether they retarded the fire to any extent. Some of the low buildings, such as Brown Bros.' bank and the Mercantile Trust Company, escaped with little loss. I would estimate the loss on the fireproof buildings at from 50 to 60 per cent of their value. All the fireproof buildings and mercantile structures, with the exception of single occupancy office buildings, carried the 80 per cent clause. The loss above the insurance will be large. The salvage outside of the fireproof buildings will be small and is confined to stocks in the basement. About all there is left is the skeleton steel frames and fireproof covering. All wood in the buildings, elevator machinery, stairways, and light iron work were destroyed."—Construction News.

OBITUARY.

Isaac Vernon Hill, of the firm of Hill & Bray, Duluth, Minn., died February 25, in Los Angeles, Cal., whither he had gone in November last, in the hope of regaining his health. He had been ill for more than a year and for nine months past was incapacitated from active practice. Death resulted from complications following an aggravated throat trouble. He leaves a widow and two daughters, aged 12 and 10. Mr. Hill was 35 years of age, and was an architect of more than ordinary ability. Many of the finer buildings of Duluth and the Iron Range were of his work. He was at one time in business in Detroit, removing to Dulnth in 1894 and forming a partnership with G. A. Tenbush, which was afterwards dissolved when Mr. Tenbush removed to Cleveland. The interment was in Los Angeles.

RED WING SEMINARY, RED WING, MINN. Omeyer & Thori, Architects, St. Paul, Minn.

THE OPEN SHOP.

Under the Declaration of Independence of the United States "all men are entitled to the right of life, liberty and the pursuit of happiness." This generalization of the privileges, as set forth in that document, entitles every man to the right to work—to exchange his labor, his skill, his genius or business ability for a fair remuneration. It also entitles the employer to engage such labor, skill, genius or ability for such an equivalent in money as may be mutually agreed upon. Such an arrangement exists to-day, untrammeled in those avocations which are not controlled by labor unionism and both employer and employe are, apparently, satisfied.

Within recent years the arbitrary demands and the arrogance of labor organizations have become intolerable, not so much in the monetary phase as in the unreasonable exactions and irrational actions which have had the effect of demoralizing industries, and none more than the building trade. It is to meet this condition of the labor world that building contractors all over the country are organizing. Since labor unions are not amenable to reason there is but one alternative—compulsion. The constitution and by-laws adopted by the National Conference of Building Contractors, held in Chicago, Dec. 10, 11 and 12, set forth this very clearly. It was a representative body, embracing 168 delegates from 71 cities and representing 123 separate organizations in the building trades. Succinctly the resolutions adopted stipulated there shall be no limitation as to the amount of work a man shall perform during his working day; no restriction of the use of machinery or tools; no restriction in the use of manufactured material, except prison made; the right to interfere with workmen during working hours is denied; no prohibition of apprentices; the foreman of the work to be the agent of the employer; all workmen be allowed to work for whom they will, and that employers reserve the right to employ or discharge workmen as the wisdom and interests dictate.

It is not to be inferred from these resolutions that the employers purpose to array themselves against unionism. Not at all. What they do intend is to no longer tolerate dictation from the walking delegate and others of his ilk. In other words, they intend to conduct their business in accordance with business ideas and principles, or not conduct it at all.

How unions will accept this new order of things has yet to develop. Heretofore it has been a cardinal principle in labor organizations that all members of a body are equal, entitled to a fixed wage and that a limited task constitutes a day's work, whether the labor is performed by time or piece. It is a recognized poor principle, as it handicaps the dextrous and capable workman, holding him down to the level of his inferior craftsman. Another cause of annoyance to contractors is the refusal of employes to use material not union made. This restriction will no longer be permitted, but the most significant provision of the resolutions is that an employer reserves the right to engage or discharge whom he pleases. This is the "open shop" clause and it means that hereafter the man who invests his money, pays for labor, assumes all the responsibility and risk, will insist upon his prerogative and employ those who, in his judgment, will render him the best service. It opens the way for every man to sell his labor to whom he pleases—whether he be union or non-union. More especially it is aimed at the sympathetic strike, the most iniquitous and tyrannical method ever devised to extort concessions, in nearly all instances unreasonable and unjust, from the helpless contractor. A firm adherence to the principles set forth in the resolutions will again make the employers arbiters of their own affairs and release them from the rapacity of the crew of grafters who have waxed fat at their expense.—The Architect and Builder.

A UNIQUE GARAGE.

The Automobile house which we illustrate on another page of this issue offers what appears to be a convenient and comfortable garage for automobiles.

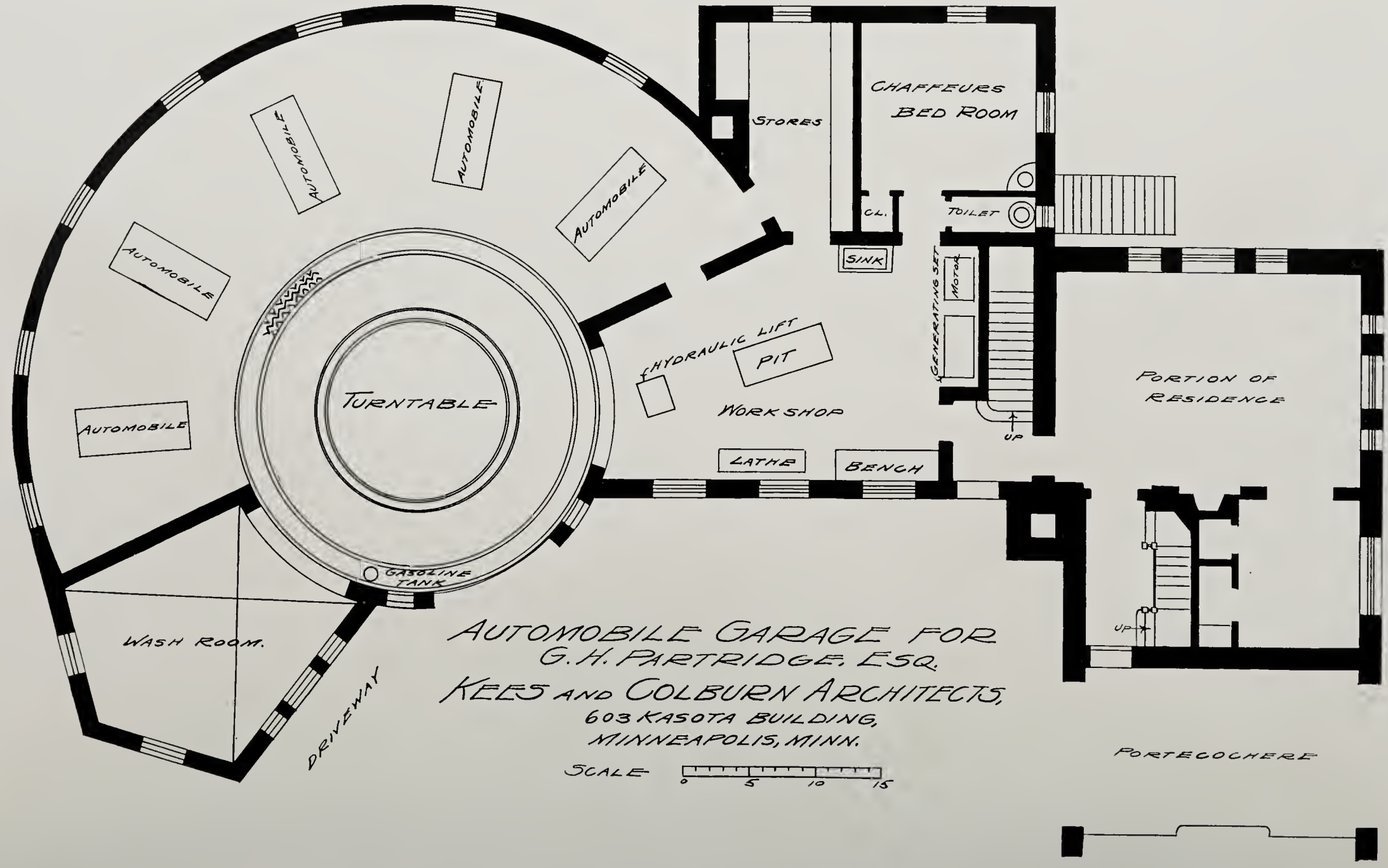
The building is to be 80x60 feet in its dimensions, one story high and to cost $12,000. It will be quite ornamental in appearance, being surmounted by a dome which will give it the aspect of an astronomical observatory, for which it will be doubtless mistaken by uninitiated passers-by.

Its unique feature is to be a turn-table so automobiles can be turned around or switched in any direction on marble slabs, where they are to stand when not in use, to a washroom for cleaning, or to a repair shop. The convenience of the turn-table can be judged from the plans furnished by Kees & Colburn, the architects, who are the originators of the idea as well as the designers.

The suggestions no doubt came from the turn-tables used in roundhouses for railroad engines. The marble slabs, which will not absorb oil drippings, take the place of the stalls for locomotives, and at each end are to be registers for ventilating and taking away the gas vapors from the machines, as well as outlets for tire air, besides having water for gasoline tanks and also electric plugs for electric machines.

The repair shop is to be equipped with a workbench, lathe, air pump and generator and hydraulic lift, and is also to have a pit so that a workman can get beneath a machine while tinkering with its internal economy. There is to be a storeroom for the livery of chauffeurs and automobile equipment, as well as a chamber in which the chauffeurs will sleep. The floor of the building is to be of tile, with the exception of the sleeping-room, and the walls are to be a glazed brick.

In the immediate vicinity of Harbin, Manchuria, there are 200 brickmaking plants, the cost of which was 500,000 rubles ($257,500). Two of these plants were constructed by the administration at a cost of 200,000 rubles ($103,000). Most of the brick produced are used in the construction of the city. A very good grade of red brick is produced and sold for 6.50 rubles ($3.35) per 1,000. Most of the work is done by the Chinese, who are paid 35 kopecks (18 cents) per day.



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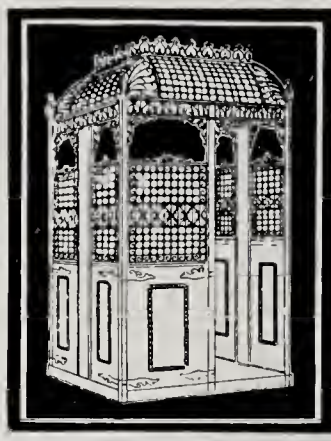

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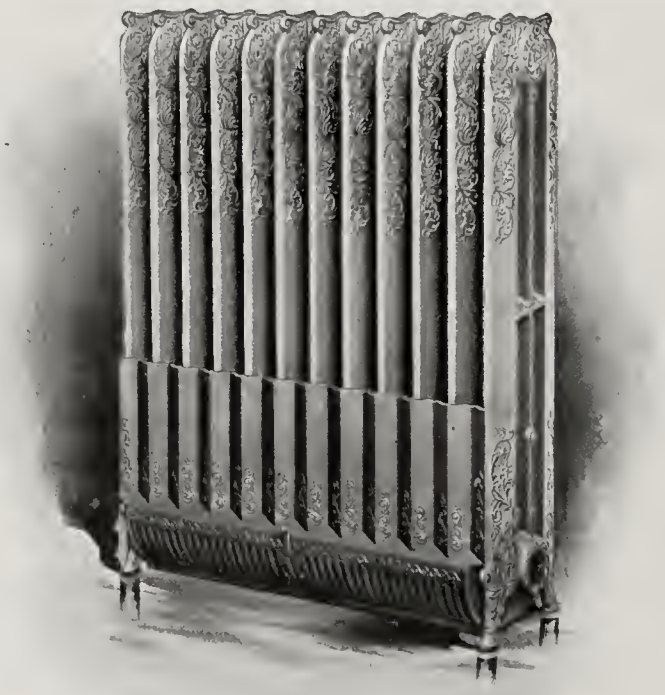

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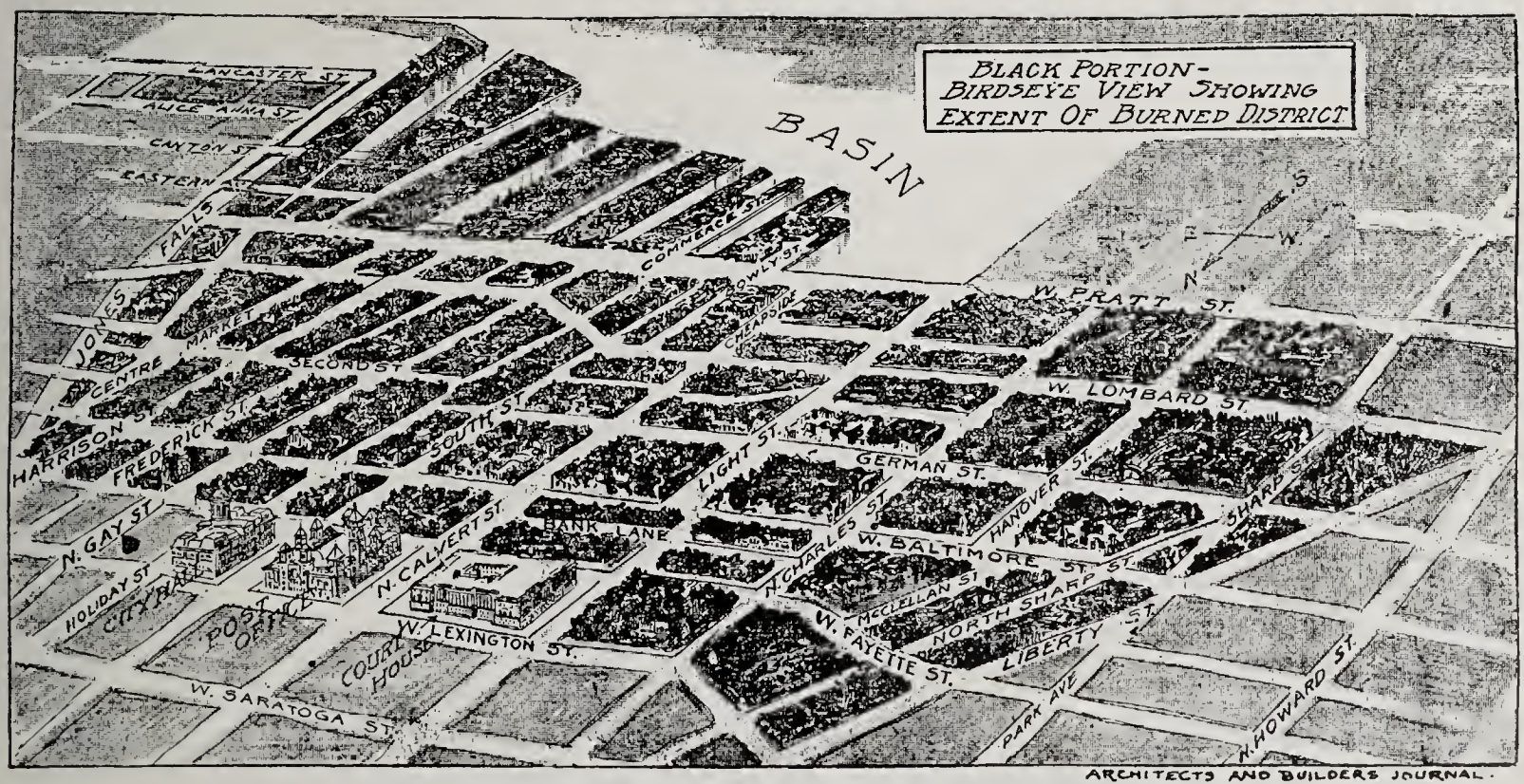

Map of that Portion of Baltimore Ravaged by the Conflagration that Started on Sunday, February 7, 1904.

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One will also get a fairly good view of the grounds from the large observation windows of the M. & St. L. trains just before arriving at their exclusive World's Fair Station.

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A MODERN STYLE IN A VENEERD DOOR

and beautiful buildings, throughout the country, that are fitted with their veneered doors and interior trim. It might be well to mention that a good sample of this firm's product can be found in the Vendome Hotel, of Minneapolis, and in the Boardman Block, St. Paul, both buildings being fitted with the product of the Minneapolis Sash & Door Co.'s factory.

The wood from which these doors are made is heavy, very strong and close grained, with a satiny surface that takes a fine polish. The birchwood has been named "The American Mahogany" by the lumbermen of the Northwest, and it seems to fully deserve the reputation given it.

We have no hesitancy in recommending these doors to all architects, and believe that it would fully repay any one interested to call at their factory, 1018 Central Ave., Minneapolis, and look over their large stock, which is always kept on hand, or write them for further information along this line.

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AN ILLUSTRATED MONTHLY JOURNAL
DEVOTED TO ARCHITECTURE AND ALLIED ARTS

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NOTICE.

Although we have added four pages to the April number of the Western Architect, we are compelled to omit the page devoted to "classified list of advertisers for this issue."

HOLLOW terra cotta forms behaved so well in Baltimore that we are likely to hear less of competing constructions in partitions in the near future. When one recalls also the superior qualities of the tile partition in confining sound, it is hard to account for the successes scored, in selling, by some competing devices in the past. It is harder to account for the fuss and expense incurred in a great many constructions to prevent the passage of sound when a simple hollow tile construction would effect the purpose.

WORKMEN in the building trades are unexpectedly turbulent in New York, where everyone supposed they had had enough of strikes for a period. Elsewhere the season so far shows less unrest than usual, possibly because the length and strenuosity of the winter and high prices of food and fuel have uncovered the bottoms of too many domestic bins. Other signs of the times are seen in the acceptance of a wage reduction by coal miners and the rise in coal prices at retail reported at New York.

THE late exhibition of Whistler's works held in Boston by the Copley society was successful beyond the hopes of its promoters, who netted some $16,000 from the enterprise. The attendance was above 60,000, and included an unusually large proportion of art lovers, who came from all sorts of places, even as far away as Chicago. The out-of-town attendance on the last day, Sunday, was particularly noticeable, people coming in from some towns in what is described as delegations. The success of his last venture of the Copley society will make it still more the envy of like associations in larger cities, none of whom seem to be able to do things as these Boston people do.

EXTERIOR plastering is making headway more slowly in the West than its merits would lead one to expect. No doubt the many ill-advised experiments that have been followed by failure are largely accountable for this condition, yet there have been enough successes to warrant a more thorough study of the situation, and such study will be pretty sure to lead to further trial. As an outer covering for frame buildings there are many situations where plastering would be very suitable, and it is well to remember that suitable materials are much more easily obtained than formerly. Our grandfathers used to make splits in thin boards and spread them laterally till plaster could be forced into the cracks, making quite an uncertain hold. We can readily get metal sheets, split and spread so that when well stapled to boarding there is no mistake about the hold for mortar. These can be obtained dipped in asphaltum, and if the boarding is covered with suitable papers there should be little trouble about corroding laths or warping boards. We have Portland cements, which the grandfathers knew nothing of, and can make much better mortar than they if we set about it right. People with experience have an idea that good outside plastering can be done on wood according to these hints at a price that will meet siding and painting. Of course there need be no painting afterwards. Good masonry support for the plastering is still better, the plastering quickly paying for itself in saving of labor and select materials for facing the masonry. It appears also that Portland cements are now to be had that are far from disagreeable in color, while "rough casts" and the various kindred finishes have merits outside of mere novelty. In cold and hot, in wet and dry lands, exterior plastering has been successfully done for centuries, and there are those who dispute that it is a lost art.

Building has become so highly developed and specialized that the cost of omitting work has become an important item in making estimates. Not long since a factory obtained a contract for furnishing the outer and inner wood finish of a chapel. Specifications for the outer work required that it be without "surfacing" or planing—as the saw left it. The office man who "billed" the work to the factory, took pains to mark all over the lists and drawings that the stuff was to be planed on the back side only—this to bring it to a proper thickness—and that all exposed surfaces were to be left as sawn. In due time, chancing to be in the warehouse, he saw stacked up ready for shipment all this outer finish fully dressed and planed, and of course it all had to be thrown away. It is safe to say that the next time the managers of the factory estimate on work in which the surfacing is to be omitted, they will add something to cover the chance of having to do the work over again.

The text of a decision by Judge Seaman, of the U. S. Circuit Court of the Northern District of Illinois, is being largely circulated by the Maple Flooring Association, and aside from the fact that it denies the validity of the patent at issue, the evidence introduced to upset the claim of novelty and the efforts of the attorneys for the patentees to overcome the effect of this evidence are both interesting. Many western architects recall the first apearance of the IXL maple flooring and its immediate popularity. Soon end-matched flooring appeared on the market, and whatever may have been its merits, it took the fancy of purchasers so well that for a time it was sold for $1.00 per M., b. m. more than the same grades with simply squared ends. Although this end matching was patented, all makers soon adopted the method and shortly everything seen on the market was end-matched.

In a legal battle for collection of royalties by the patentee, the validity of the patent seems to have hinged on the novelty and value of the end-matching in enabling the boards to be laid directly upon joists without reference to having the end joints come directly over joists. Defendants, as a matter of course, attacked the value of the device for this use, which is uncommon at any rate, nearly all such flooring being laid on a lining of common boards. They also, in skirmishing for evidence to disprove the claim of novelty, found a floor of a church in Washington, Miss., probably built seventy years or more, made of pine boards, hand matched on sides and ends, joined and laid in all respects as described in the patent, and for the obvious purpose of saving the lumber that must have been wasted had joints been made only on joists.

The name of the builder of this had passed into oblivion, but evidence of the character of the work was disclosed by repairs made some ten years since, as well as by more recent changes. The patentees claimed that all this only showed that end matching was a lost art at the date of their patent, and therefore could not under the law detract from its validity; but his honor thought differently. This is probably not the end of the case, but there seems to be small likelihood that the free use of end-matched flooring on lining boards will be interfered with by patent.

Mr. Hearst, the wicked Wm., appears to have opened a career for commerce commissioners. In all the years that the Interstate Commission has been in existence it has been unable to learn how it might learn about goings-on in the way of traffic agreements. Now that Mr. Hearst has pushed things up to the supreme court, that body, by a surprising majority, holds that public carriers doing business across state lines can be made to disclose their contracts. This practically settles the question as to traffic within states as well, for no one can imagine a state court as rendering a decision not in agreement with the U. S. courts in such matters. Lawyers probably foresee a bumper crop of litigation spring up as a result of this decision—plaintiffs everywhere who believe themselves to have been wronged by discriminating rates. May there be enough of them to frighten the common carrier into dealing justly in the future.

The mild hysteria that came with the outbreak of the war, carrying some good people so far as the belief that we would all have to mix in before it is over, seems to have subsided. In place of this it begins to look as if the principals are not so glad as they were

Japan is announced as about to unleash the war correspondents, which may indicate that she is less sure of a crop of heroes than at the outset, or either of many things. As to Europe, aside from Russia there be both fresh experiences and cool heads to act as restrainers: The English have large bills yet to pay in connection with the late South African venture where they were obliged to send an army considerably more numerous than the entire population to be conquered. The German Kaiser has a throat to worry about, and a troublesome group of "socialists" in parliament. French socialists are credited with such political strength and such positive opposition to wars other than defensive, that the swashbucklers and contractors despair of being able to draw the country into the broil. Again, as outsiders learn just a little about the combatants, they find their sympathies lagging a bit. As motives are studied more, it becomes more difficult to keep the contractor out of sight, and to down the suspicion that the land grabbing instinct plays a large part. But to fight for land that is incredibly populous already! Are there no degrees of folly in this predatory business! Surely outsiders will not be drawn in in hope of any of the spoils now in sight. Except for the hopes excited in the patriotic breasts of shipbuilders, it does not look at this writing as though this war had in it much for the outside world. The rest of us may as well keep on devoting ourselves to the arts of peace.

Stone cutting machines are said to be at the bottom of more or less labor troubles. Doubtless their encroachments would be resented still more were the stone cutters more in position to "feel their oats." In fact, they are suffering from the competition of terra cotta far more than from the cutting machines. There is almost a tragic side to these whims of Fashion, who can shift her favors in a day, and leave a host of skilled men without employment, as was well shown by the suddenness with which terra cotta leapt into favor. Perhaps the best insurance that a skilled trade, like the stone cutters, can have against these disastrous changes of fashion or productive methods, lies in broader education. The skilled stonecutter who also makes such study of form as to give him a mastery of modeling, is likely to find demand for his services when other materials than stone are in favor. If he is not a stranger to the drawing board or to modeling clay, his chances for surviving these changes will be greatly improved.

* *

It is to be hoped that a feature which insurance people seem to have entirely overlooked will have been sufficiently shown up by the Baltimore fire to bring about such an adjustment of rates as will bring the public to a somewhat more just appreciation of that modern enormity, the sky-scraper. Certain sins of the sky-scraper, such as its robbing the neighborhood of air and light, its causing an intolerable congestion of street traffic, its thrusting into the sky line vast masses of material, disposed on three sides perhaps to suit the purse and convenience of the owner, and composed on the fourth according to some half formed ideas of artistic effect, have been condoned for one reason or more. Sky-scrapers have been held to be the expression of great enterprise, drawing business, enhancing real estate prices and so on. Furthermore, there has been so much that was good about the construction of these buildings that they have been held to be a good fortification against spreading fires. Insurance people and all concerned seem to have lost sight of the fact that, while the sky-scraper is in many cases itself fireproof as to structure, it stores on a given ground area several times the combustibles gathered within the same area under conditions which preceded it. Not only does the twenty-story building contain five times as much furniture, flooring and fittings as the old five-story building on the same ground area, but most of these combustibles are above the reach of fire departments, and once under way, create a volume of heat hardly ever equaled within a like area under old conditions. This enormous heat cannot be "wet down;" it discharges itself at immense heights, in a way to spread flying cinders far and wide, and introduces a new element of terror into great conflagrations. The false sense of security for which the modern sky-scraper is responsible is so great that, almost without exception, its own windows have no fire protection. Will the Baltimore experience sufficiently awaken the building world to the necessity of fireproofing openings in outer walls of such buildings, or will the added experience of increased insurance rates be needed?

ENTRANCE TO ODEON BUILDING, ST. PAUL, MINN.
James Alan MacLeod, Architect, St. Paul.

HALL SEAT IN GERMAN RENNAISANCE STYLE FOR MRS. E. N. SAUNDERS, ST. PAUL, MINN.
Manufactured by Wm. Yungbauer, St. Paul, Minn.

DAVID R. FRANCIS, PRESIDENT,
Louisiana Purchase Exposition.

LOUISIANA PURCHASE MONUMENT

One of the most interesting exhibits at the St. Louis World's Fair will be that of municipal improvements and the model street. Albert Kelsey, who is in charge of the architectural details, has made each of the different buildings conform to a civic scheme, but not detract from their individuality. In short, there is to be a civic center where the best and latest improvements will be harmoniously exhibited. This is the first time in the history of international expositions that the special feature, in a separate space, of out-door municipal exhibits has been undertaken. The rapid advance and development of American cities within the past decade, and the great interest which is now being manifested by municipalities and the general public on the subject of city beautifying, have encouraged the Exposition authorities to believe that an object lesson, suggestive and practical, will meet a popular demand in this country, and be of great practical interest.

ADMINISTRATION BUILDING, LOUISIANA PURCHASE EXPOSITION.
Cope & Stewardson, Architects, Philadelphia, Pa.

NEW FLOORING MATERIAL.

By Henry M. Morgan.

Architect Siegwart, of Lucerne, has patented a new system of concrete flooring, consisting of hollow tubes of mortar and iron. It is fire-proof, and will, I believe, be of considerable interest to builders in the United States.

It is clamed that this system is an improvement on the inventions of Monnier, Hennebique, Koener, and others. It consists of manufacturing, in a factory, the mortar into hollow beams for forming a floor or roof ready for delivery to the builder—one which can be laid together on the supporting walls without planking. By this means one floor can be laid in a very short time, and the floor so laid can be used to work upon at once without scaffolding.

This appears to be a great advantage compared with the usual devices of stone, plaster, etc., which are dependent largely upon temperature and weather, and in all cases must be left for some days to dry before they can be walked upon.

One advantage claimed for the Siegwart system is that no workmen are required other than the ordinary laborers. Another fact which should be considered is that armored beams which are made in the building can be depended upon for uniformity when the mortar is mixed in exactly the same proportions and when it is not influenced by shocks, frost or rain during the time of setting. When this work is done in the factory it is easier to secure uniformity and protect the beams against weather conditions.

The beams manufactured at Lucerne have a uniform breadth of 25 centimeters (9.84 inches), and are manufactured in five sizes, viz., 9, 12, 15, 18, and 21 centimeters (3.5, 4.7, 5.9, 7.08 and 8.36 inches), high, according to the length of span and load. The size of iron rods in the beams is between 5 and 10 millimeters (1.96 and 3.0 inches), and generally six such rods are used in each beam. Two of these rods are laid parallel with the under border of the beam, and the other four are bent upward into the form of a knot at the ends in order to strengthen their holding power. The proportion of cement with coarse sand is 1 to 4. Though the beams are made hollow, they have the same supporting power as though they were solid, with a great reduction of weight. This is an important factor where freight charges are to be considered. The beams, being hollow, offer also more favorable conditions for heating. The sides are ridged, so that the cement for joining them together can enter into the vacant spaces and thus form a solid mass. The laying together of the beams is done exactly as with wooden beams.

The beams are supplied in different lengths. In Lucerne they are made up to 5.5 meters (18 feet) long; in Italy and Germany, up to 6.5 meters (21.3 feet) long; and in Russia, up to 7.5 meters (24.6 feet) long. They can be used, in addition to floors, for terraces, roofs, staircase supports, and for walls where there is a side pressure, as for instance, in coal bunkers, warehouses, etc. It has been demonstrated that with a load from four to five times as great as the normal the beams have only bent to the extent of one or two millimeters (0.0394 and 0.0788 inch).

The chief advantages claimed for these beams are: Great supporting power and security from fire; they come dry and hard from the factory and can, therefore, be used at once as floors for working on; greater facility and speed in building is secured by their use; freedom from excess of heat and cold by reason of their being hollow; thickness of completed floors is reduced by their use; the beams can be used as a heating floor by sending warm air through them.

The manufacture of the beams as practiced in the Siegwart beam factory in Lucerne, Switzerland, and in other European countries is very simple. They are manufactured in layers of 2.5 meters (8 feet) breadth and not singly. The hollow spaces are formed by means of iron molds, around which the cement is laid and the iron rods placed in position. These iron molds are constructed so that they can be reduced in size by the turning of a screw and withdrawn when the cement has become hard. The beams are cut, before the cement has set, by means of a patent cutting machine, and which can be placed in any position.

Six to eight hours after laying the beams the iron molds can be withdrawn, but they are generally left to harden for four to six days before they are separated. After two or three weeks they are ready for delivery.

There are already a large number of buildings, both public and private, in Switzerland, in which the Siegwart beams have been employed, and in all the buildings now in course of construction in Lucerne they are being used.

At present there are three factories in Germany, three in Russia and one in Italy occupied in manufacturing beams under the Siegwart patent.—Architect and Builder's Journal.

One of the most frequent dangers arising from want of care is that which results from leaving the plumbing apparatus unused for several weeks or months, as when the family shuts up the house for the summer and goes to some health resort. In a few weeks, sometimes in two weeks, the water in the traps so far evaporates that they are unsealed, and then follows a stream of air into the house, bearing with it micro-organisms which gradually settle in the layer of fine dust which gathers on floors, shelves, over doors, gas fixtures, etc. If, now, the family returns and occupies the house, using only the ordinary processes of sweeping, dusting, etc., which do not destroy the germs, but merely scatter them about, there is serious danger of sickness. On leaving a house in this way, arrangements should be made to have every fixture in it flushed at least once a week, and if it be necessary to move into a house which has been for some time unoccupied, and where you are not sure that these precautions have not been observed, then thorough cleansing with cloths wetted with disinfectant solutions should be employed as a matter of ordinary prudence, and should be applied to every exposed surface.

COUNCIL TABLE, IN MINNEAPOLIS COMMERCIAL CLUB.
Designed and Executed by L. A. McIvor, Minneapolis, Minn.

FLOWERS IN WASTE PLACES.

You can grow flowers anywhere, if you only know the proper kind for each location, says Country Life in America. There is no portion of the earth's surface that cannot be covered by some kind of plant growth, nor a situation so desperate that it could not be redeemed with the life and cheer and color that flowers give. You have only to select the right variety of seed and you will find that there is no clay too tough, no sand too hot and dry, no rocks too devoid of soil, no winter too severe. If you have a swamp and are afraid of it, you can transform it into a water-lily pond or a bog garden. If you own a bit of woods you can fill it with wild-flowers. In the heart of the biggest city a ten-inch hole can be made in the pavement, as they do in Boston, to cover the wall of the house with vines. The slums have their window-boxes, and houseleeks grow upon the shingles of a roof. Even the dump-heap that you pass daily need not be an eye-sore. Put a package of sunflower, poppy or morning-glory seed in your pocket, and scatter the seed over the offending spot. And of all the people who enjoy the transformation, you will enjoy it most.

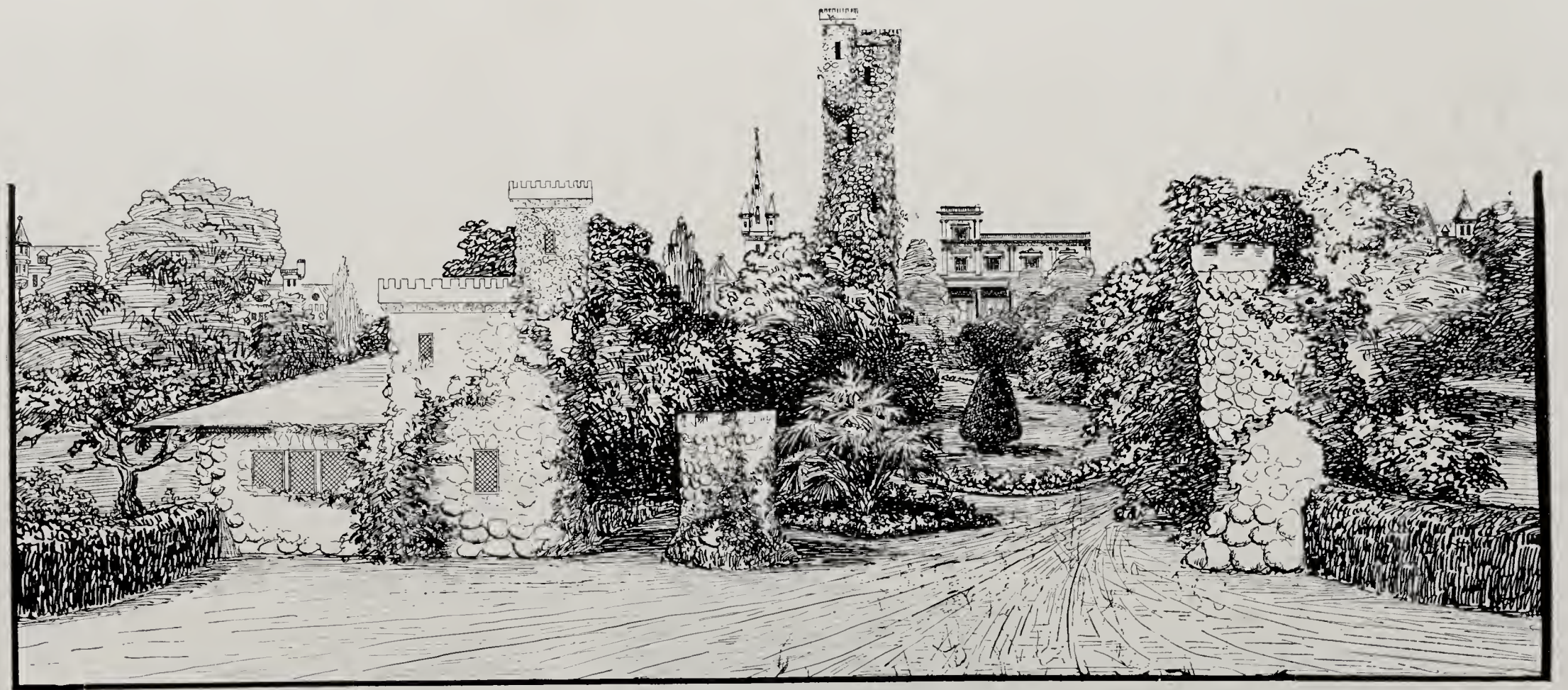
A BUILDING WITHOUT WINDOWS.

It is stated that the Belgian national pavilion at the coming World's Fair in St. Louis is the largest building in the world without a window. The absence of windows was deliberately planned by Gustav Chartrain, the architect, to secure an even distribution of softened sunlight.

"Windows let in a blinding blaze of light and the intervals between them are dark," says Mr. Chartrain. "We have avoided this by omitting the windows and constructing the central section of the arched roof, extending the entire length of the building, of stained cathedral glass, which will let in abundant light."

The pavilion is 267 feet long and 191 feet wide. It is 55 feet high in the center of the great arched roof, and the great dome in the center is 100 feet high. The glass section in the top of the roof is 20 feet wide. It is a yellowish brown, and the soft light cast through the interior increases the beauty of the finishings and decorations.

Great arched entrances on all sides make up for the absence of windows in the exterior appearance.



ENTRANCE TO MERIDIAN HEIGHTS, INDIANAPOLIS, IND.
John H. Stem, Architect, Indianapolis.

RESIDENCE OF COL. MORRIS, CLEVELAND, OHIO.
Meade & Garfield, Architects, Cleveland.

RESIDENCE OF MR. SAMUEL DODGE, CLEVELAND, OHIO.
J. Milton Dyer, Architect, Cleveland.

RESIDENCE OF W. L. RICE, CLEVELAND, OHIO.
Alfred Granger Architect, Chicago, Ill.

RESIDENCE OF W. D. SCHULTZ, ZANESVILLE, OHIO.
Alfred Granger, Architect, Chicago.

WEBSTER HIGH SCHOOL BUILDING, QUINCY, ILL.
Harvey Chatten, Architect, Quincy.

ENTRANCE TO R. A. CRAWFORD'S RESIDENCE, DES MOINES, IOWA.
Liebbe, Nourse & Rasmussen, Architects, Des Moines.

"DEN" IN RESIDENCE OF W. D. SCHULTZ, ZANESVILLE, OHIO.
Alfred Granger, Architect, Chicago, Ill.

GARDEN ENTRANCE TO RESIDENCE OF W. D. SCHULTZ, ZANESVILLE, OHIO.
Alfred Granger, Architect, Chicago.

POST OFFICE BUILDING AT SLEEPY EYE, MINN.
A. F. Gauger, Architect, St. Paul, Minn.

HALF-TONE PERSPECTIVE FROM WATER COLOR. F. L. Lively, Colorist
Turner & Koch, Architects.

An unlooked for sequence in the drainage of New Orleans is the appearance of hordes of ants which have become as threatening as the plagues of Egypt They attack the woodwork of houses and speedily destroy it, making their way into warehouses where costly goods are stored, and seem to be immune to insecticides. The presence of them in such quantities is said to be caused by the drying out of the soil. When it was saturated the ants could not breed in it; now that it is no longer wet the ants have multiplied in such numbers that they defy suppression. One gentleman is said to have been literally eaten out of house and home, the ants having tunneled the timbers in all directions so that nothing but a shell was left. Creosoted wood seems to be a preventive against the marauding insects, and many establishments have been started on such work.—National Builder.

A Japanese house is the simplest thing in the world, consisting as it does of a post at each corner and a roof One may say it is all on one floor. And in the daytime it is all one room, if it is a small house. The number of bedrooms in it depends on the number of bedrooms the owner requires. They are divided by night by paper shutters fixed in grooves like the divisions of an old-fashioned workbox. There are no doors or passages. Your bedroom acts as a passage, and when you want a door you slide back the nearest panel. Two sets of shutters go around the outside. These outside shutters cannot be slid in the same promiscuous fashion as the other. Each is held in its place by the next and the last one is secured with a bolt of wood. There are plenty of Japanese houses which when secured for the night would hardly stand a drunken man leaning against them. An Englishman's house may be his castle—a Japanese house is his bedroom, and his bedroom a passage.

CAST IRON COLUMNS.

BY C. A. P. TURNER, M. AM. SOC. C. E.

The recent collapse of the Darlington building in New York city may perhaps render interesting and fitting a short discussion of the suitability of cast-iron columns in buildings and the proper methods of proportioning them, together with a few practical hints on strength and correct proportions of bracket connections.

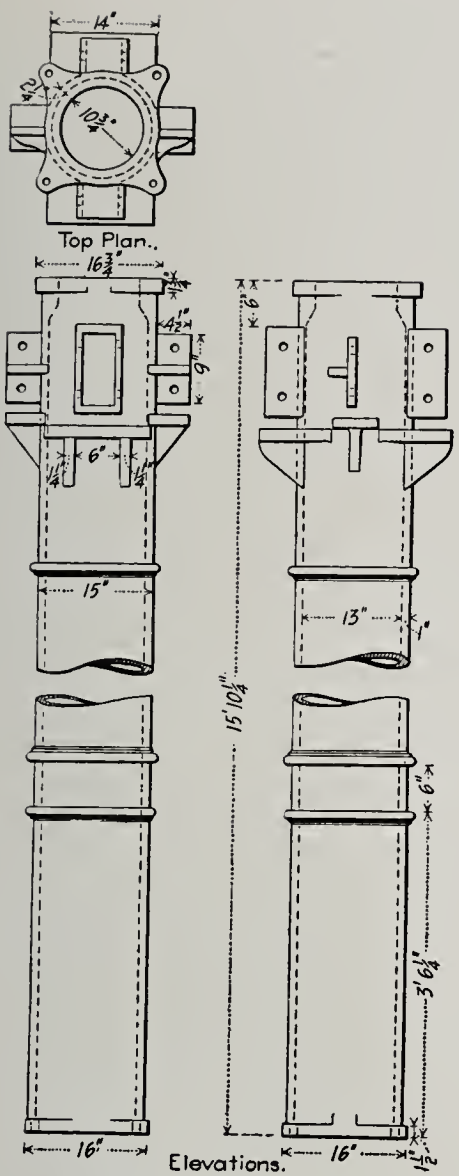
In the following remarks the writer will say frankly that there is little offered that is new, but as the facts are on record in engineering rather than architectural literature, they may be none too familiar to the busy members of the profession.

To the structural engineer familiar with these facts, failures, such as that of the Darlington building and the earlier one of the Ireland building, are surprising, not from the fact that they have occurred in structures admittedly figured under authorized municipal building laws of New York city, but that similar failures have not been more frequent in view of the fictitious values assigned to the crushing strength of cast-iron columns, which renders the actual factor of safety less than fifty per cent of what it is supposed to be.

We quote herewith Mr. Ewing's report of tests for the building department of New York city and present the data in the compact form given by the Engineering News, January, 1898, to which we would refer our readers.

TABLE III.—RESULTS OF BREAKING TESTS OF CAST-IRON COLUMNS.

Column No.	Length	Outside Diameter	Thickness			Location of Break	Breaking load, lbs.	Compression	Character of Material at Fracture	Remarks	Sectional area sq. in.	Breaking load per sq. in. of area, lbs.
			Maximum	Least	Average							
I	190¼ in.	15 in.	1	1	1	About 3 ft. 4 in. from bottom.	1,356,000	.....	Medium grain, blow holes and dirt.	One place foundry dirt extended half way through; another place foundry dirt and honey comb between inner and outer surface.	43.98	30,800
II	190¼ in.	15 in.	1 5/8	1	1 1/8	Bet. 1 and 5 in. from bottom.	1,330,000	.....	Medium grain; fairly unfirm, spots fdry dirt.	At a pressure of 1,302,000 a slip of some kind occurred, which dropped the pressure to 1,275,000; agan run up until break occurred. Upper portion sprung ½-in. in 9 ft. 4 in.	48.03	27,700
B 2	190¼ in.	15 in.	1¼	1	1⅛	Bet. 3¾ ft. from bot'm and 6½ ft. from top.	1,198,000	2½ in. bet. 150,000 and 1,-108 000.	Coarse but uniform; a few flaws.	At 1,108,000 column sprung badly, Fig. C; movement recorded under compression.	48.03	24,900
B 4	190¼ in.	15 in.	1 7/32	1	1⅛	Bet. bottom and one-third up from bot'm.	1,246,000	2¼ in. bet. 150,000 and 1,-246,000.	Coarse in center; finer on outside; cinders and slag.	Bad spots, cylinder pockets and blow holes near middle of column; small cracks in necking near top; column given a permanent set.	49.48	25,200
5	190¼ in.	15 in.	1 1/16	1	1 1/64	At bottom flange.	1,632.500	2 5/16 in. in 8 ft. 3 in.	Fine grain and unif'm where no flaws occurred.	Flaws and foundry dirt at point of break; load was carried as high as 1,804,-000. The dummy head against which column rested was found broken after the test; this may have had something to do with character of break.	50.84	32,100
6	190¼ in.	15 in.	1¼	1⅛	1 3/16	No break permanent set of 1 3-16 ins. in 8 ft.	Over 2,082,000	⅜-in. bet 232,000 and 1,-108 000.	No break.	Pressure run up to 1,108,000 and released. It was again run up to 2,082.000 released and run up to 2,033,000. Column could not be broken; capacity machine reached.	51.52	Over 40,000
XVI	160 in.	Bet. 8¼ and 7¾ in.	1¼	⅝	1	Wherechaplet was placed at middle, and at ends.	651,000	.....	Metal good; med'm gr'n	At time of breaking, column had a vertical deflection of 3 9-16 in. and a horizontal deflection of 1½ in.; fracture seemed due to flexture.	21 99	31,900
XVII	160 in.	8 in.	1 3/32	1	1 3/64	At middle and at ends	612,800	.....	Fine grain unif'm and free from flaws.	Vertical deflection, 4¼ in. horizontal deflection, 1 11-32 in.	22.87	26,800
7	120 in.	6 1-16 in.	1 5/32	1⅛	1 9/64	At middle and at each end.	400,000	.....	Good even grain no flaws.	Vertical deflection, 3 in.; horizontal deflection, ⅞-in.	17.64	22,700
8	120 in.	6 3-32 in.	1⅛	1 1/16	1 7/64	At middle and at each end.	455,200	.....	Fine grain unif'm and free from flaws.	Vertical deflection 3¼ in. horizontal deflection, 1 11-32 in.	17.37	26,300



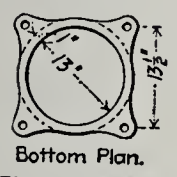


Fig. 4.—Details of the 15-in. Columns.

Column I.—Column suddenly broke under a total load of 1,356,000 lbs. into 10 pieces; the fractured surface began about 3 ft. 4 ins. (average) from the bottom.

The quality of metal was medium grain; foundry dirt and blowholes were quite numerous; in one place the foundry dirt extended half way through the metal; in another place, there was a thin layer of foundry dirt and honeycomb midway between the inner and outer surfaces; between this layer and the two surfaces, the metal was perfectly sound; this layer of foundry dirt contributed to the weakness of the column as was evident from an inspection of the fractured surface.

The column sheared at an angle of about 30 degrees with an element of the surface, and about 45 degrees with a normal to the surface, inside of the layer of foundry dirt, above referred to only. This layer of foundry dirt extended about 6 ins. around (circumference) on column. At another fractured surface there was no defects occurred, the metal sheared along a spiral course about 45 degrees with an element of the surface, and at an angle of 45 degrees with a normal to the surface; this surface was about 15 inches long.

Column II.—The column crushed near the lower end, many of the pieces being quite small; the bottom flange was left intact, the fractured surface beginning at the top of the flange or 1¾ inches from the faced end of the column and extending around the shaft in an irregular manner reaching 5 inches away from bottom flange in one place.

The shaft of the column above the fractured portion was found to be permanently sprung ½-inch in a distance of 9

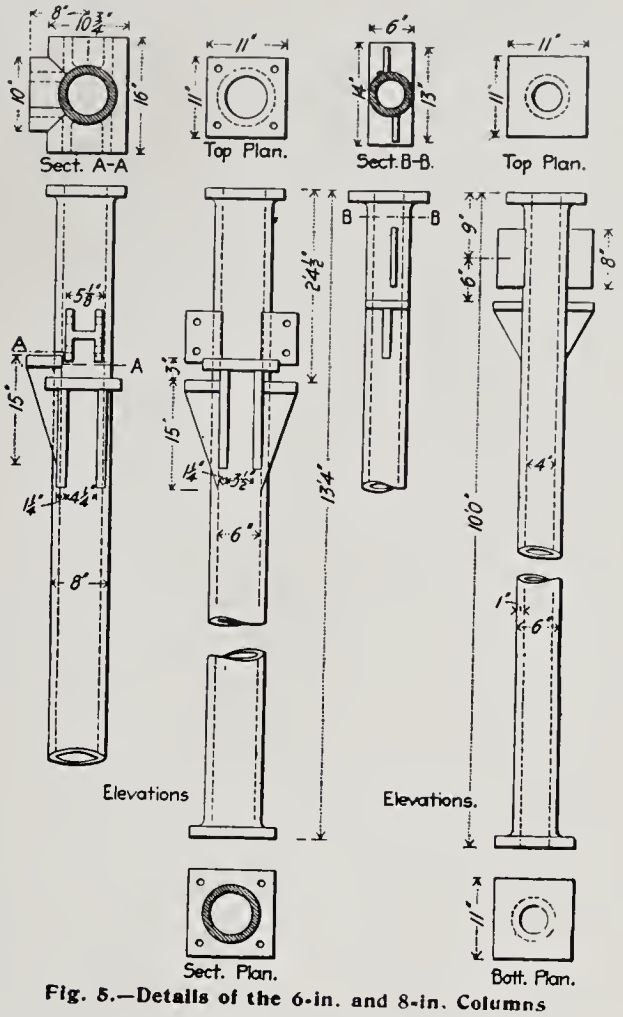


Fig. 5.—Details of the 6-in. and 8-in. Columns

feet 4 inches along shaft. The quality of metal at bottom of column, where fracture occurred, was medium grain and quite uniform in grain. Considerable quantities of foundry dirt was found at fractured surfaces and where the column crushed into small pieces, the foundry dirt extended all the way through in many spots.

The shaft sheared in several places at an angle of about 45 degrees to the elements of the surface of the column parallel with its axis, the fractured surface following a sort of spiral path around the shaft. The metal at the same time sheared through at an angle of from 30 to 45 degrees with a normal to the surface of column.

Column B 2.—The fractured portion of column was below the center, beginning 3 feet 9 inches from bottom and 6 feet 6 inches from top of column.

Quality of metal, rather coarse, but quite uniform. Flaws occurred in spots, but not bad. There was evidence of shear at 45 degrees, the same as in preceding columns.

Column B 4 (Fig. 6)—The quality of metal was rather coarse in center of shell, and somewhat finer toward the surfaces. Cinders and slag in considerable quantity, two bad spots nearly opposite at bottom of column where metal was poor; one of these was 5 inches long on outside (around column) and extending about half way through the metal. On the opposite side the defective portion was 4 inches wide on inside, and extended for one-third to two-thirds the way through the metal. There was indications of shear at about 45 degrees, similar to cases previously noted, at the bottom, where the column broke into small pieces.

The total number of pieces was 15.

The fractured surfaces revealed many cinder pockets and blowholes near middle of column. Small cracks were observed in the necking near top of column.

Column 5 (Fig. 7)—Column broke into 14 pieces; all fractures occurred below the lower necking on column and broke through bottom flange. The permanent set in the shaft between the upper and lower necking was 2 5-16 inches in 8 feet 3 inches; the upper part of the shaft above the necking remained perfectly straight after the test. Flaws were found

in fractured surface near bottom, of foundry dirt. One bad flaw about 5 inches wide and 4 inches high (long) on outside extending three-fifths of the way through.

Quality of metal was rather fine grain, and very uniform where no flaws occurred. Part of the shaft remained intact to end, and part of the flange was left on. After the test, it was found that a dummy head against which the end of the column bore, was broken in such a way that the load on the column was eccentric after the head gave out; the nature of the fracture sustains this belief.

Column 6.—The test was discontinued when a load of 2,033,000 pounds had been reached, the capacity of the machine having been reached. The permanent set of the column after it was removed from the testing machine was 13-16 inch in a length of 8 feet 5 inches. The concave side ,after the test, was about 90 degrees from the joints of the flack, and undoubtedly was the top of the column as cast in the mold.

Column XVI.—One fracture occurred at a point where the chaplet for holding down the core was imbedded into the metal of the column. The metal outside of the chaplet was ¾-inch thick, and the chaplet 3-16 inch metal. The cast metal did not adhere to the chaplet.

The column broke into 6 pieces (at middle and at each end). The fracture at the middle was nearly squared off, and very near the exact middle point between the two ends. The fractures were about 1 foot from each end and irregular in outline.

The metal was good, of medium grain. Wires were attached to the shaft of the column, 6 feet 6 inches from bottom, and ran perpendicularly to the axis of the column, one horizontally and one vertically. These were carried to the outside of the building in which the tests were being made, and the actual vertical and horizontal deflections of the column were observed in conjunction with the corresponding loads.

There was no evidence of shear at the fractured surfaces, as in the case of the larger columns. Failure seemed to result primarily from flexure.

Column XVII.—The column broke into 8 pieces, the fractured points being at the middle and near each end.

Quality of metal at fractured surfaces was fine grain, uniform and free from flaws.

Column 7 (Fig. 8) was broken into four pieces, the fractures being 3 inches to one side of the middle of the column and near each end. The quality of the metal was good, even medium grain, with no flaws.

Column 8.—The quality of metal was fine grain, uniform and free from flaws. The column broke into four pieces, fractures being at middle and near ends; broke off nearly square at each point; no signs of shear in metal.

Two of the 15-inch columns tested, Nos. B 2 and B 4, were taken from the Ireland Building, which, it will be remembered, collapsed Aug. 8, 1895 (Eng. News, Aug. 15, 22, 29, Sept. 5, Oct. 3, 1895). The four remaining 15-inch columns were made from drawings prepared by the Department of Buildings of New York city (Fig. 4), and were as nearly as possible duplicates of the Ireland columns.

The columns marked I. and II. were made by the Jackson Iron Works, 27th street and East River, New York city, of their ordinary run of metal. They were cast while other columns were being cast, with no knowledge of their ultimate use. The two marked 5 and 6 were made by the Healy Iron Works, Brooklyn, N. Y., who were informed of what the columns were wanted for. The drawings for the 6-inch and 8-inch columns (Fig. 5) were also made by the Department.

All the columns broken were, we understand, fair samples of the average cast-iron columns used in buildings in New York city, and regularly passed by the Building Department as coming within the provisions of the law.

The Building Law of the City of New York says:

The strength of all columns and posts shall be computed according to Gordon's formulae, and the crushing weights in pounds, to the square inch of section, for the following materials shall be taken as the coefficient in said formulae, namely: Cast-iron, 80,000. . . . The factors of safety shall be as one to four for all posts, columns and other vertical supports when of wrought-iron or rolled steel, and as one to five for other materials, subject to a compressive strain.

Applying Gordon's formula, as used by the building department:

$$\text{S (breaking strength)} = \frac{80{,}000\ a}{1 + \frac{L^2}{400\ d^2}}$$

"a" being area of section, "d" the exterior diameter in inches, and "l" the length of the column in inches, and we have for the columns of these tests a calculated breaking strength per square inch for the fifteen inch columns of 57,140 pounds, and 40,000 pounds for the six and eight inch columns. Now this calculated strength of columns B2 and B4 is 128 per cent more than the actual, their factor of safety supposed to be five by the New York building law, or six by the Minneapolis ordinance, is in reality only 2.2 under the former and 2.6 under the latter ordinance, and this under central loading only, no account being taken of the likelihood of eccentric loading.

Lanza applied mechanics (page 372) quotes from fourteen tests of cast-iron mill columns at Watertown, 1887-'88, crushing strength ranging from 25,000 to 63,000 pounds per square inch, and exhibiting no definite relation between unit crushing strength and dimensions of columns. He considers 25,000 to 30,000 pounds per square inch the maximum ultimate strength we can safely rely on, and with this recommends a factor of safety of from five to six, limiting the length of the column to twenty diameters, with thickness sufficient to secure a sound casting. Further increase to be made for eccentric loading. W. H. Burr, Eng. News, June, 1898, expresses similar views.

Such criticism of working stresses naturally raises the question as to the basis or data from which the formula is derived. The experiments of Hodgkinson upon iron differing materially from that used as structural cast-iron to-day, forms this basis. To quote Mr. Kent (Mech. Engrs. Pocket Book, page 250): "Modern cast-iron columns such as are used in the construction of buildings are very different in size, proportions and quality of iron from the slender pillars used in the Hodgkinson experiments. There is usually no check by actual tests or by disinterested inspection upon the quality of the material; the tensile, compressive and transverse strength of cast-iron varies through a great range (the tensile strength ranging from less than 10,000 to over 40,000 pounds per square inch), with variations in the chemical composition of the iron according to laws as yet very imperfectly understood, and with variations in the methods of melting and casting. There is also a wide variation in the strength of the same melt when cast in bars of different thicknesses. It is, therefore, impossible to predict, from the data given by Hodgkinson, of the strength of columns of Low Moor iron in pillars seven

and a half feet long, two inches diameter, and one-third of an inch thick, what will be the strength of a column of American cast iron, quality not stated, in a column sixteen feet long, twelve to fifteen inches in diameter and three-quarters to one and a half inches thick."

Another difficulty in formulating a safe rule for the design of cast-iron columns is due to the danger of hidden defects in the material, such as internal stresses, due to unequal cooling, cinder or dirt blow-holes, cold shuts and cracks on inner surface, which cannot be detected by external inspection.

Cylindrical columns are less liable to internal cooling stress than square and are to be preferred for that reason.

Variations in thickness, due to rising of core during casting, is a common defect determined only by drilling.

Bearing in mind the fact that the factor of safety in these columns is or may be but 2.2 under a perfectly central load, and that the loading from brackets is nearly always eccentric, and adding the bending stress above noted, and it is evident that the erector may, by the slightest misjudgment, overload an inherently weak frame, and loss of life result. The responsibility evidently should rest, not with the erector, but with the designer figuring and specifying the dangerous construction.

When the walls are of suitable thickness, or the extreme width of building sufficient to give reasonable stability, the above criticism does not apply with equal force where columns are suitably proportioned.

Taking up now the subject of "Brackets," we will first present the reports of Ewing, which we copy from the Eng. News before referred to:

RUINS OF DARLINGTON BUILDING, SHOWING BROKEN CAST IRON COLUMS.
From Carpentry and Building.

Referring now to the type represented in the Darlington building of skeleton construction, in which the erector in pushing work with an energy that would seem most commendable, were it not for the unfortunate result, carries up two or more tiers in advance of the curtain walls, connects the frame by the few bolts provided through cast lugs or flanges for splicing sections of columns, and superimposes a load perhaps fifty per cent greater than the figured safe load on the columns, and the column is subject to the vibratory stresses due to wind and the handling and moving of parts in erection.

Fig. 14.—Fracture of Brackets, 14-in. Colums, No. 6.

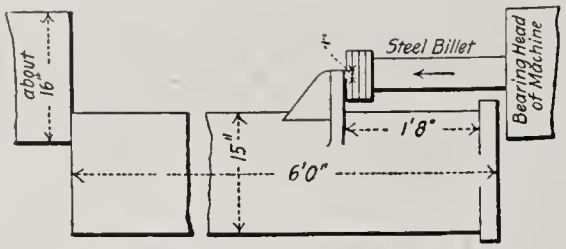


Fig 1.—Manner of Applying Loads to Brackets.

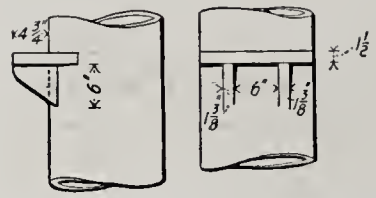


Fig. 2.—Tests Nos. 1, 6, 21, 22.

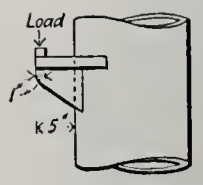


Fig. 3.—Test No 2 Showing Manner of Application of Load.

TABLE I.—RESULTS OF TESTS OF BRACKETS ON CAST-IRON CLUMNS.

No. of Test	Dimensions as in Figure	Column number and Diameter	Bracket for Girder or Beam	Load Distributed as in Fig. 5, or at end, as in Fig. 3.	Breaking Load, lbs.	Area of fractured surface above bot'm of shelf,* sq. in.	Thiceness of metal in column, top of shelf
1	No. 2	II., 15 ins.	Girder.	Unequally Distributed.‡	363,000	20.15	1 1-16 ins.
2	" 3	" "	"	End.	153,500	20.88	.....
3	" 4	" "	Beam (small)	Distributed.	133,700	10.	.....
4	" 6	" "	" "	End.	99,800	8.25	1 1-16 ins.
5	" 2	I., 15 ins.	Girder.	Distributed.	267,300	21.	.....
6	" 2	" "	"	End.	146,800	21.	.....
7	" 4	" "	Beam (small).	Distributed.	131,000	8 61	.....
8	" 4	" "	" "	End.	49,140	8 3	.....
9	" 7	B 2, 15 ins.	Girder.	Distributed.	233,000	27.19	.....
10	" 7	" "	"	End.	133,700	23.07	.....
11	" 7	" "	Beam (small).	Distributed.	114,600	Not meas. †	.....
12	" 7	" "	" "	End.	49,100§	Not meas.	.....
13	" 7	B 4, 15 ins.	Girder.	Distributed.	252,500	18.	1⅛ ins.
14	" 8	" "	"	End.	141,800	21.14	1⅛ ins.
15	" 9	XVI,, 8 ins.	.....	Distributed.	335,700	Not meas.	1 3-16 ins.
16	" 9	XVII., 8 ins.	.....	End.	131,000	Not meas.	1 1-16 ins.
17	" 10	No. 7, 6 ins.	.....	Distributed.	142,000	20.3*	.....
18	" 10	No. 7, 6 ins.	.....	End.	69,800	Not meas.	.....
19	" 10	No. 8, 6 ins.	.....	Distributed.	122,800	20.9*	.....
20	" 10	No. 8, 6 ins.	.....	End.	72,900	Not meas.	.....
21	" 2	No. 6, 15 ins.	Girder.	Distributed.	159,300	27.9	.....
22	" 2	No. 6, 15 ins.	"	End.	95,500	26.2	.....

*The area of fracture measured was the entire developed area of fracture which lay above the plane of the bottom of the shelf, this portion of the fracture being supposed to have taken place by the tension shearing. The fractured area below this plane was not measured. in tests Nos. 17 and 19 the fracture took place by shearing parallel to the axis of the column, and the area measured is the whole area sheared.

‡Greater near the shaft.

†This bracket broke in a peculiar manner, taking out a piece of the column shaft above the bracket, 4½ in. wide (average) by 11 in. high

§No. 12.—The figure 49,100 does not indicate the strength of the bracket, es tee column had been weakened by the tearing out of the other three brackets.

TABLE II.—STRENGTH OF CAST IRON BRACKETS, COMPUTED FROM TESTS.

No. of test	Breaking load, lbs.	Area of fracture ab'ye bot'm shelf A, sq. ins.	Area of vertical section of brackets: Shelf B, sq. ins.	Area of vertical section of brackets: below shelf sq. ins.	Area of vertical section of brackets: Total C, sq. ins.	Load per sq. ins. of Area Approximate: A, lbs.	Load per sq. ins. of Area Approximate: B. lbs.	Load per sq. ins. of Area Approximate: C, lbs.	Load on end—E, or distributed—D
1	363,000	20.15	22.5	16.5	39	16,100	16,100	9 300	D.
2	153,500	20.88	22.5	16.5	39	7,000	7,000	3,900	E.
3	133,700	10.	7.5	6.2	13.7	13,400	17,700	9,800	D.
4	99,800	8.25	7.5	5.6	13.1	8,400	9,200	5,300	E.
5	267,305	21.	22.5	16.5	39	12 700	11,900	6 900	D.
6	146,800	21.	22.5	16.5	39	7,000	6,500	3,700	E.
7	131,000	8.61	7.5	6.2	13.7	15 200	17,500	9,600	D.
8	49,140	8.3	7.5	6.2	13.7	5,900	6,600	3,600	E.
9	233,000	28.19	21.	15	36	8,200	11,100	6,500	D.
10	133,700	23.07	21.	15	36	5,800	6,400	3.700	E.
11	114,600	Not gi,vn	———	———	———	———	———	———	———
12	49,100	" "	———	———	———	———	———	———	———
13	252,500	18.	21.	15.7	36.7	14 000	12 200	6,900	D.
14	141,800	21.14	20.7	13.8	34.5	6,700	6,900	4,100	E.
15	335,900	.....	16.6	33.8	50.4	.....	20,200	6.700	D
16	131,000	Not giv'n	———	———	———	———	———	———	———
17	142,000	20.3[2]	6	7	13	7,000[3]	23,700	10,900	D.
18	69,800	.....	6	7	13	.....	11,600	5,400	E.
19	122,800	20.9[2]	6	7	13	5 900[3]	20,500	9,400	D.
20	72,900	.....	6	7	13	.....	12,100	5,600	E.
21	159,300	27.9	22.5	16 5	39	5,700	7,100	4,100	D.
22	95,500	26.2	22.5	16.5	39	3,600	4,200	2,450	E.

[1] Nos. 17, 18, 19 and 20, that is, all the brackets in 6-in. columns, broke by shearing through the metal of the bracket.

[2] Sheared areas.

[3] Breaking load per sq. in. of sheared area.

Fig. 12.—Fracture of Brackets on 8-in Columns, XVI and VII..

No. 1.—The fracture tore out the main body of the column for a depth of about 6 inches, and width of about 8 inches. The angle of fractured surface with the surface of shelf at center of shelf was about 15 degrees; angle of inner lines of brackets about 45 degrees; angle at edges of shelf about 90 degrees. Metal rather coarse, especially where it cooled slowest.

No. 2.—Metal broke off squarely at edges of bracket at an angle of about 30 degrees, with the surface of the shelf at the center of the shelf; between the center and the two edges the angle of fracture varied between 30 and 90 degrees at intermediate points. Bracket tore out from the column in the same way as No. 1. Quality of metal same as No. 1.

No. 3.—Bracket tore out part of the shelf, leaving approximately, a round hole. Fracture surface at center of shelf made an angle of about 10 degrees with surface of shelf, this increasing each way to about 45 degrees with the shelf at the edges of shelf.

Fig. 11.—Fracture of Brackets on 15-in. Columns, B2, I and II.

No. 4.—Tore through only a small hole in the column. Angle of fracture of the middle of shelf about 45 degrees to the shelf surface and increased gradually to 90 degrees at edges of shelf. Metal uniform, flawless, coarse medium.

No. 5.—Angle of fracture at middle of shelf 20 degrees with shelf surface; angle at sides 90 degrees, and on line of outside of brackets 45 degrees. Metal medium grain, uniform, flawless.

No. 6.—Angles of fracture with plane of top of shelf, at middle of bracket, 20 degrees; at edges, 90 degrees. Metal medium grain, flawless.

No. 7.—Metal medium grain, flawless.

No. 8.—Angle of fracture with top surface of shelf, at center of shelf, 15 degrees; at edges of shelf, 45 degrees.

No. 9.—Angles of fracture with surface of shelf 10 degrees to 15 degrees for 3 inches on either side of center of bracket 90 degrees at edges of shelf, and 45 degrees at edges of brackets. Metal fine grain at edges, medium towards center, free from flaws.

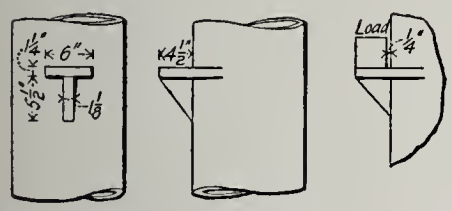


Fig. 4.—Tests Nos. 3, 7, 8. Fig. 5.—Test No. 3

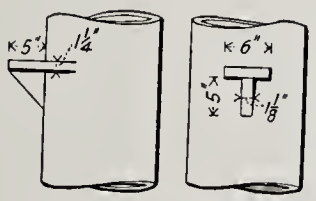


Fig. 6.—Test No. 4.

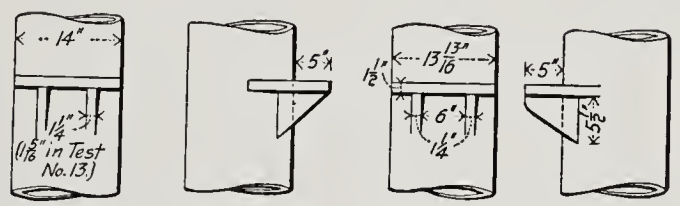


Fig. 7.—Tests Nos. 9, 10, 13.

Fig. 8.—Test No. 14.

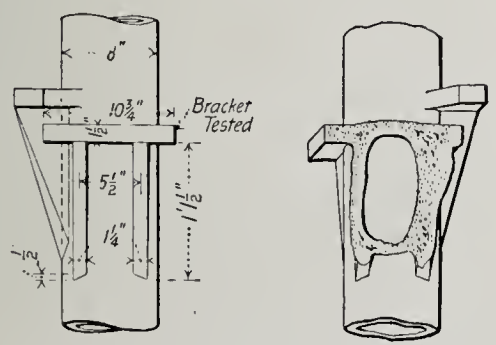


Fig. 9.—Test No. 15.

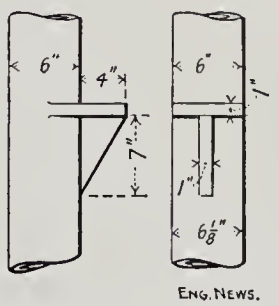


Fig. 10.—Tests Nos. 17, 18, 19, 20.

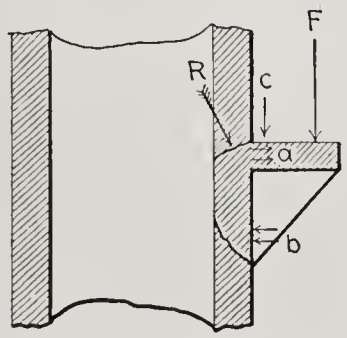


Fig. 15.—Sketch Showing Probable Manner of Fracture.

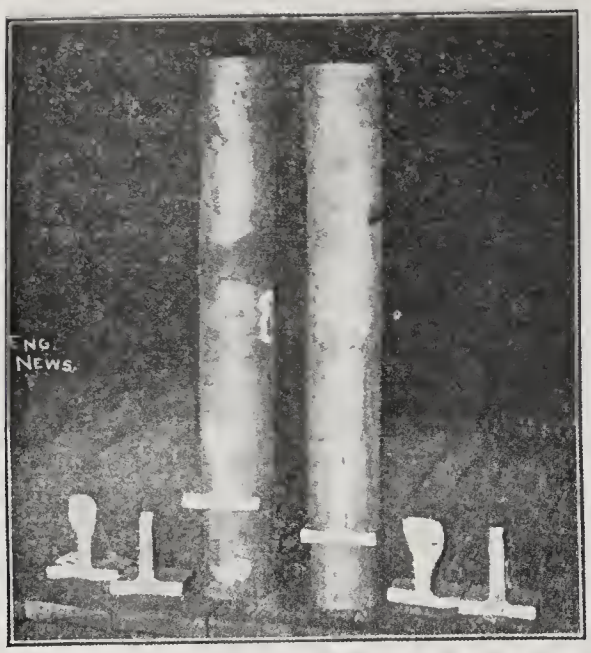


Fig. 13. Fracture of Brackets on Colums, Nos. 7 and 8.

No. 10.—Angles of fractured surface measured from plane at top of shelf, at center of shelf, 30 degrees; at edges of shelf, 90 degrees; on outer line of brackets, 45 degrees.Metal medium grain, rather fine at edges; one flaw, about ⅜x¾-inch at top of fractured surface.

No. 11.—This bracket broke in a peculiar manner, taking out a piece of the column shaft above the bracket 4½ inches wide (average) by 11 inches high. Metal medium grain, no flaws.

No. 12.—The breaking load, 49,100 pounds, does not indicate the strength of the bracket, as the column had been weakened by the tearing out of three other brackets, and the body of the column failed in this case.

No. 13.—Angle of fracture with surface of shelf 10 degrees for 11 inches of the width of the shelf and 90 degrees at edges. Metal medium to coarse grain, no flaws.

No. 14.—Angles of fractured surface of shelf with top surface of shelf 12 degrees at center, 90 degrees at edges. Metal rather coarse at center and finer at edges.

No. 15.—Bracket broke as shown in Fig. 12. Metal free from flaw and medium coarse.

No. 16.—Fracture very irregular, as in Fig. 12. Metal medium grain, uniform and flawless.

No. 17.—Metal flawless and medium grain. The bracket failed by shearing off direct, the fractured surface of the rib being pear-shaped, as shown in Fig. 13.

No. 18.—The bracket sheared off at its junction with the column. The fractured surface revealed a shrinkage cavity about ¾-inch in diameter, besides more or less defective metal. Part of the surface was dark and more or less honeycombed; the other part was fine and even.

No. 19.—The bracket failed by shearing. The lower part of the bracket carried away part of the shaft, leaving a pear-shaped surface similar to No. 17. Two small shrinkage cavities were revealed near the bottom of the bracket, one about 1 inch in diameter and tne other about ¼-inch diameter. Metal fine and uniform, except the flaws noted.

No. 20.—The bracket sheared off at its junction with the shaft. The metal was medium and uniform, except that there was a shrinkage crack, a cavity about ¾-inch in diameter, and defective metal over an area of 1¼ by 1½ inches.

No. 21.—The metal was sound, very fine grained, light gray in color and very brittle. Angles of fracture with surface of shelf 45 degrees at middle of shelf, increasing on either side to 90 degrees. Metal was torn through shaft on one side. (See Fig. 14.)

No. 22.—Metal same quality as No. 21, one flaw 2 square inch where shelf joins bracket. Bracket broke in three pieces. Body of the column was not affected. (The pieces are shown at the left in Fig. 14.)

The irregularity of the failures precludes any specific method of analysis, and an approximate rule of thumb based on the sectional area of the bracket through the shelf and supporting ribs has been suggested. Reducing the results to strength per square inch of shelf and supporting ribs, we have the ultimate strength per square inch of but 2,500 to 5,600 pounds for loads at end of shelf, and 4,000 to 10,000 pounds for distributed loads.

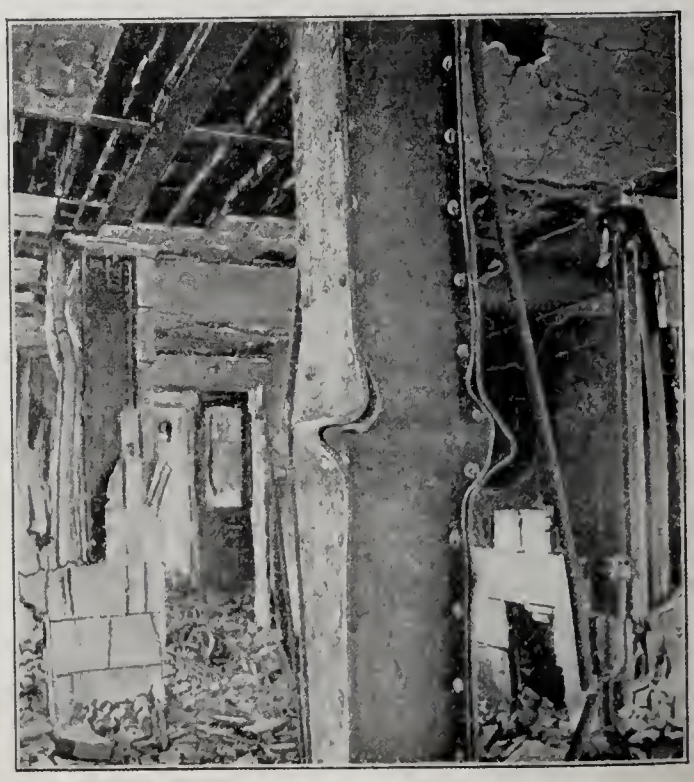
It is evidently desirable to bring the load as near to the shaft as possible, making the shelf as narrow as practicable.

In order to avoid temperature stresses due to unequal cooling, it is a safe rule to limit the thickness of brackets supporting the shelf, to the thickness of the shell of column, and if necessary put in more than one rib.

When the bracket is much thicker than the shell, a coarse granulate fracture will be noted if bracket be broken.

Supporting ribs should not be made too short, as it will be noted that the majority of fractures were not failures of bracket and ribs by shear, but by breaking a section of shell from the column to which the bracket is attached, leaving a pear-shaped hole. Additional length of rib would add strength, as depth does to a beam or truss.

In conclusion it should be noted that the columns selected for tests noted in this article, are of such thickness as to secure far more uniform results than could be legitimately expected with the greater variations of thickness used in every-day practice.



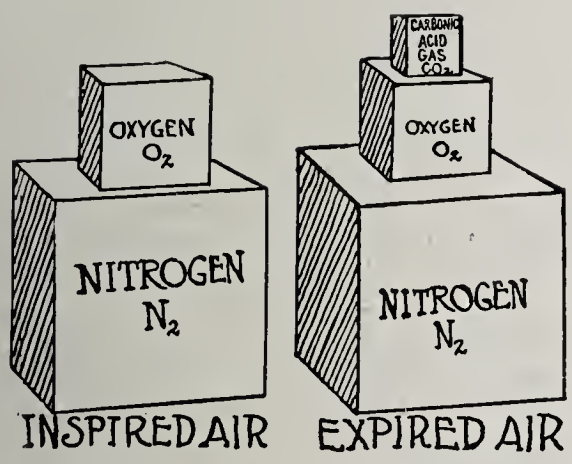
Steel Column on Seventh Floor, of the Calvert Building, Baltimore, Md. Buckled by Heat through the Loss of its Protecting Covering. Carpentry and Building.

WHY WE NEED VENTILATION.

Morris R. Ebersole.

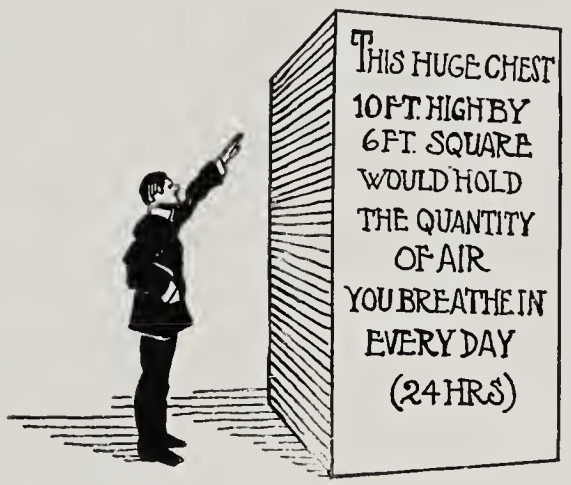
Early man—the creature of the field and forest—gave very little thought to the construction of his habitation. His inventive genius was chiefly spent in devising implements of war or of the chase, and his life was spent in the open air, occupied in such pursuits. Even with the advent of the first stages of civilization we are surprised at the meagre efforts to make his abode a healthy and comfortable place. It is true that among these early attempts we find masterpieces of architecture, but as far as we have been able to ascertain, were not these attempts chiefly designed for exterior effect? The dwellings of the ancient and middle ages were notable for discomfort and inconvenience, and especially is this remarked in the lack of appliances or inventions for heating and ventilation.

The early races were subjected to the same changes and hardships of climate that we are, but probably these hardships were not felt so keenly as they are now among highly civilized, sensitive and nervous peoples. At any rate, with the advance of learning and investigation, and, we might say, *sensitiveness*, it has been only during the past century that any material advance has been made in heating and ventilating appliances. The basis for the need of heating apparatus is physiological, while the basis for the need of ventilation may be said to be chemico-physiological, and it is this phase which we would discuss.



Atmospheric air, as every one knows, is composed in the greater part of three or four well defined substances or gases, namely, nitrogen, oxygen, carbon dioxide, water vapor and ammonia. In its natural state, whether from the equator or the poles, the composition of air is almost invariable, with the exception of the amount of water vapor. Man was made to exist in this envelope of air surrounding the earth, and therefore his anatomy is affected one way or the other according to the composition of the air he breathes. The life-giving and vital principle of air is oxygen. This element revives, resuscitates, sustains and feeds, and the breathing organs are so minutely and beautifully proportioned that the least change or diminution of this element in the air inhaled is immediately evidenced by a feeling of discomfort or nausea—an unmistakable sign that something is wrong.

In these days when so much of our lives is spent indoors, some provision must be made that the air we constantly breathe is not lacking in any of its healthful, *natural* qualities. Expired air differs from inspired air *by just so much harmful ingredients as is the purpose of nature to eliminate from our systems.* These eliminations and chemical changes in the composition of air in our lungs are constantly going on. Nature has provided that man should eliminate such things as are harmful to him—when elimination ceases, life ceases—and these waste products are *in themselves* poisonous and dangerous to health if we take them again into our systems.

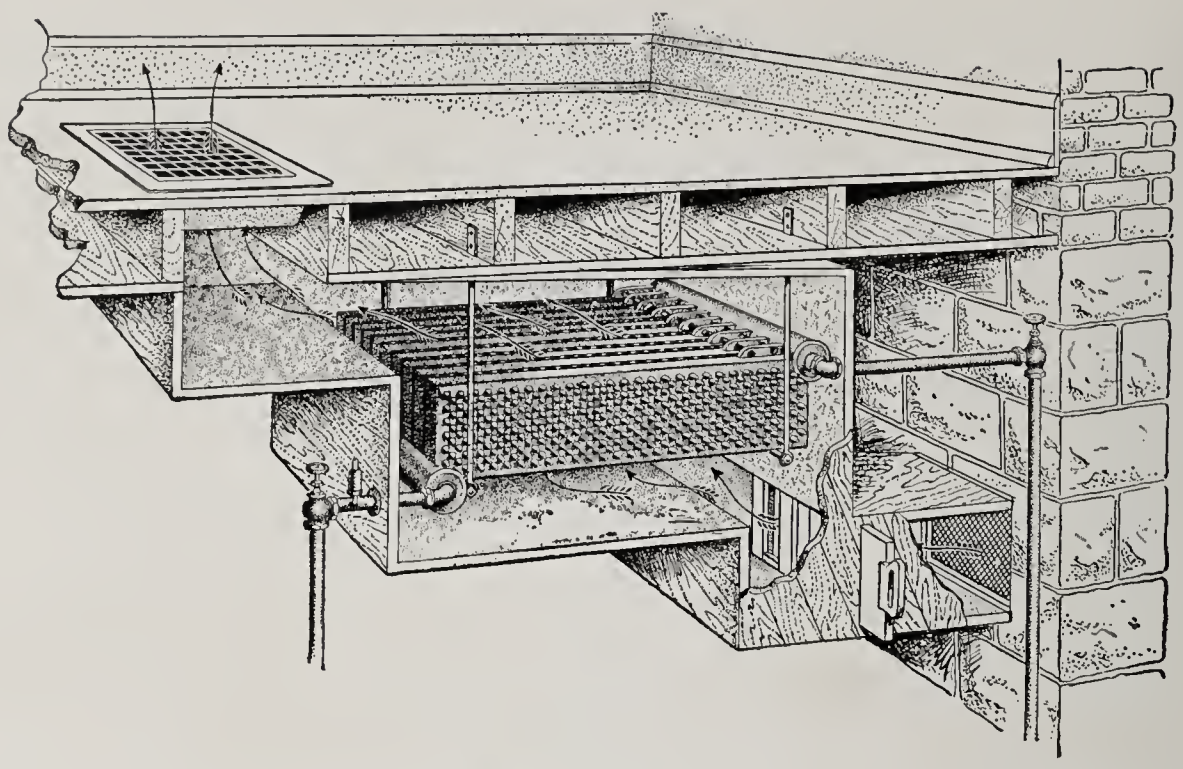


In expired air the amount of carbon dioxide—an inert suffocating gas—is increased, and the amount of oxygen is proportionately diminished. Man cannot live in an atmosphere in which the oxygen is too rare; or, in other words, too highly diluted with nitrogen. Nitrogen is not poisonous, but it cannot sustain life, and it acts as a dilutent to the oxygen, which if present in the pure undiluted state would cause a more rapid combustion than the delicate tissues of our lungs could bear. Again, other complex poisonous products are exhaled in the breath, which of themselves would rapidly cause decay and disease.

For these reasons, and living in confined spaces as we do, most of our lives, in which space we breathe and have our being, it is only the pressure of the inexorable laws of nature which *drives* us to think of ventilation and to make provision for it.

What are called indirect and direct-indirect radiators are manufactured and installed to provide for heating and ventilation, and our illustration shows more clearly than a description one of the most approved methods of installing an indirect radiator.

Our bodily comfort and health also demand a pleasant temperature—so that heating and ventilation are bound together by requirements of nature beyond our control and which we must observe if we would preserve health and happiness.



ONE METHOD OF MAKING PROVISION FOR VENTILATION WITH A STEAM HEATING APPARATUS, NOTE THE FRESH AIR DUCT AND INTRODUCTION OF WARMED FRESH AIR INTO THE LIVING ROOMS

A HOLLOW-TILE FIREPROOFING TEST.

The fires that occur in offices in fireproof structures are not usually noticed, because the ordinary furniture in an office will burn itself out or is extinguished before the doors can be burned through. But a fire occurred January 23 in the Masonic Temple, in Chicago, that for several reasons is notable.

The Masonic Temple is nineteen stories in height and when it was designed, some fifteen years ago, was the highest office building in the world. It is steel and hollow-tile construction according to ordinary methods. On the fifth floor a concern manufacturing X-ray machinery had a large shipping-room filled with boxes, excelsior and other combustible materials used in packing. This became ignited in some way and the result was a most spectacular fire, and as it occurred in the middle of the day, was witnessed by vast crowds. The fire burst through the windows and as the firemen felt that the building was secure and that nothing could be saved in the rooms where it occurred and that great damage would be done by water, it was allowed to burn for half an hour without any attempt being made to extinguish it. When this was done the interior showed the effect of the fire in blackened walls, consumed woodwork and some loss of plastering, but that was all. A close inspection directly after the fire was extinguished showed the structure remained intact, with no more evidence of damage than the interior of a furnace shows after the fires are drawn. This condition is taken as a matter of course by those who own hollow-tile-fireproofed buildings everywhere, for the greatest fires that have occurred in such structures, notably the Athletic club fire in Chicago and the Exchange building in Minneapolis, both burned when in process of finishing and full of flooring and trimming lumber, with no doors to stop the drafts and spread of flames have proved that our present method of fireproofing is absolutely indestructible as far as practical purposes require. The additional cost should be added to the general cost, as generally, as cost of brick for the walls, and besides the rebate on cost by a lessened insurance rate, the saving of a valuable building, as in the case of the Masonic Temple, justifies any difference that may exist between the best fireproofing methods and "slow-burning," "fire-resisting" or "mill-construction" methods that are resorted to to comply with laws that are too inadequate in their demands and too lax in their enforcement.—Inland Architect.

AN ARCHITECT BREAKS THE RECORD.

It is reported that the first commission given to any architect for the rebuilding of Baltimore was secured by Howells & Stokes, of New York. Mr. Howells was at the fire in less than twenty-four hours after its outbreak, and left Baltimore on the following day with the contract for building the new Stock Exchange. He was given six days in which to complete plans for a structure for the new exchange, the price to be of no consideration. He immediately put a force at work night and day, and on Friday took the completed plans and specifications to Baltimore for inspection, where on Monday of this week they were accepted. This is said to be the shortest time on record for the planning of a building of such monumental character as a Stock Exchange, where price consideration is eliminated. Mr. Howells is a son of William Dean Howells, the distinguished author.—Construction News.

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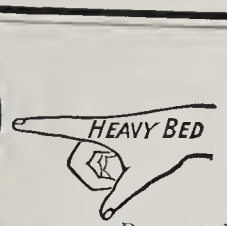

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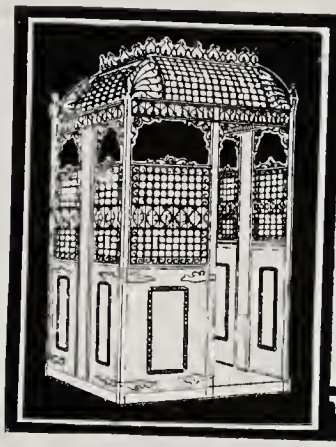

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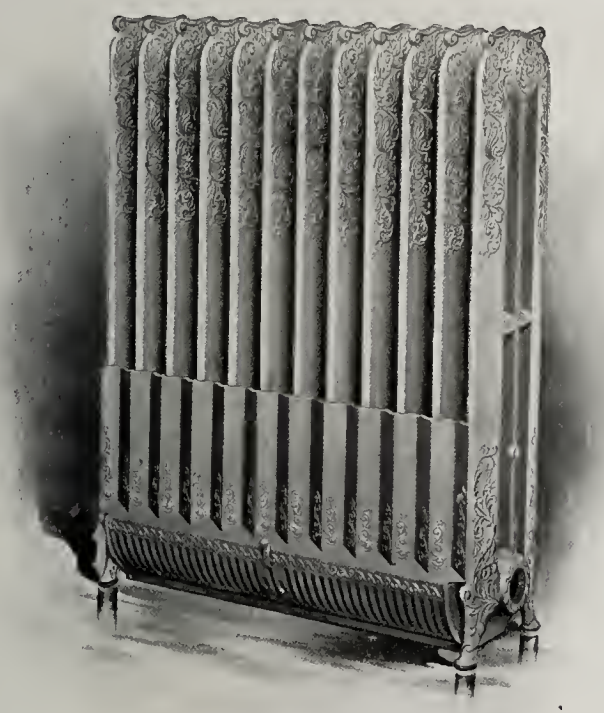

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ST. PAUL, Globe Building.

NEAR PERFECTION.

A copy of the second edition of volume V, No. 5, of The Boiler Magazine, by the Kellogg-Mackay-Cameron Co., of Chicago, Minneapolis, Kansas City and Seattle, has just come to hand, and is pre-eminently the best thing of its kind that has ever entered the office of the Western Architect, though it has seemed almost impossible to improve on "The Boiler Magazine" for 1903.

The work, as was last year's, was edited and compiled by Morris R. Ebersole, manager of the publicity department of the above well-known house and reflects great credit on his ability as designer, author and publisher.

The present number contains many articles of great interest to architects, heating concerns and the general public, among which may be mentioned: "To Ventilate the Nursery," "The Question of Healthful Heating," "The Care of the Boiler and Radiator," "The Need of Ventilation," "Drafts and Chimneys," The Value of Fresh Air," "Greenhouse Heating," "New Heating Plants in Old Houses," etc.

Mr. Ebersole, who is a valued contributor to the Western Architect, is making an enviable reputation as a writer upon heating, ventilating and kindred subjects.

RESIDENCE ELEVATORS.

The growth in installing the push button electric automatic elevators in private residence is one of the latest and most important steps in architecture. New residences of any special pretensions are now quite generally equipped in this manner, and many alterations are being made in the older constructed houses especially to accommodate these elevators, as well as for dumb waiters which are of the automatic electric nature. In many of the most costly residences, a separate automatic elevator is also put in for the exclusive use of the servants as well. Each and every floor has its push button at each landing, and when the button is pressed, the car responds by coming to the floor and stopping there of its own accord. The door of the elevator remains locked until the car has come to a complete stop at the proper landing place.

The mechanism is very simple, and children operate them as readily as adults. The Winslow Elevator & Machine Co., Chicago, Ill., are the manufacturers of these Automatic Electric Elevators, and nothing of the kind elsewhere manufactured, comes anywhere near equaling the "Winslow" in perfection and reliability.

Architects and others who are interested, will be cheerfully furnished with all detailed information regarding these delightful and essential elevators, by addressing the company as indicated above.

A NEW CONCERN.

Mr. P. H. Carney, of Mankato, Minn., and for many years known to the architects and builders of the Northwest as the head of the Mankato Cement Co., has formed a partnership with Mr. J. D. Hilger, of St. Paul, Minn., to deal in Portland and Natural Hydraulic Cements, Lithocolla Hard Wall Plaster and Mineral Fireproof Paints. The firm will be known as The Hilger-Carney Co., and will be located in the Island Warehouse, on Nicollet Island, near the Northern Pacific Railway tracks, which will give the new concern many advantages in the way of shipping, especially throughout Minnesota and the Dakotas.

As both Mr. Carney and Mr. Hilger are men of long business experience, with a wide circle of acquaintances among those connected with the building trades, as well as with the heads of the engineering departments of the various cities throughout the Northwest, we predict a pleasant, prosperous and successful career for the latest concern to enter into the building material and supply business of the Twin Cities.

OF GREAT ASSISTANCE TO ARCHITECTS.

Architects who are continually having trouble with contractors who persistently represent that they are unable to secure the brand of roofing tin which they specify for roofs, will be glad to learn that the American Sheet & Tin Plate Co., of Pittsburg, are making special efforts to have the trade carry their "M. F. Old Style" and "U. S. Eagle New Method Terne Plates" which are reported to be the best roofing plates either in this or any other country, and they desire to assure the profession that there will be less difficulty in the future in procuring their goods in every locality.

The American Sheet & Tin Plate Co. are taking special pains in issuing a model specification for tin roofing, which we print herewith. This house also desires to call the attention of architects and builders to the fact that bad paint is often chargeable with the early failure and destruction of tin roofs. It needs only a little reflection to convince one that nothing short of a first-class linseed oil paint, should ever be used on either the upper or under side of sheet metal work.

COPY OF J. D. MCILROY & SON'S SPECIFICATIONS FOR TIN ROOFING.

FLAT SEAM ROOF.

First: Use tin of good quality; see that the tin is square; notch corners 1 inch: turn ½ inch edge; use 7 nails or cleats to the sheet; hammer smooth with mallet; flux with rosin, using plenty rosin; solder with hot soldering copper, soldering on top of seam and soak the solder well into seam; use on IC tin 5 pounds of ½x½ solder, on IX tin 6 to 7 pounds per square. See that the rosin is well cleaned off after the roof is finished; then give the roof one coat of paint made of pure English venetian red or pure oxide of iron and pure boiled linseed oil and a little turpentine; in thirty to ninety days a second coat of the same paint, or good graphite, using in each case only linseed oil for a thinner; in one year a third coat; after that you will be required to paint only once in every three or four years. We take no stock in painting under side of flat seam roof. If the sheeting boards are not tongued and grooved, there should first be put on a layer of dry felt paper to exclude the air from cracks and joints and to prevent nail heads from coming in contact with tin roof. If the sheeting boards are old and dry, 20x28 inch plates are preferable; if the sheeting boards are wet and green, 14x20 inch plates are preferable. 20x28 inch sheets will give you an average measurement on roofs of 385 feet per case, 112 sheets 20x28 inches. Average measurement on roof 14x20, 112 sheets 187 feet to box.

STANDING SEAM ROOF.

Have the tin square; notch corners for seams a little to ease the bending of the several layers; allow ½ inch for cross seams; solder well; put tin in straight rolls 20 inches wide;

use 1¼ and 1½ inch tongs for side or standing seams; cleat every 12 inch, 2 nails to cleat; be sure to have your seam perfect; never put a standing seam roof on where you have less than 1½ inch fall to the foot; paint the same as Flat Seam Roof. In Standing Seam Roofs always put a layer of dry felt paper on roof before laying tin, it will exclude the air from seams and will prevent nail heads in sheeting from coming in contact with the tin. You will have an average of 352 feet per box of 112 sheets, 20x28 inch tin. If the above directions are followed you will have no trouble, provided a good quality of tin is used. We can show roofs now which have been exposed thirty-five to forty-five years and are still intact.

COLUMBUS STEEL ROLLING SHUTTER CATALOGUE.

The Columbus Steel Rolling Shutter Company Columbus, Ohio, has recently issued a very interesting catalogue devoted to steel rolling doors, shutters and partitions, for the manufacture of which this company has achieved an enviable record. The catalogue contains only a few pages, but it is succinct and concise, with ample illustrations and sufficient descriptive matter to give people a comprehensive idea of the product of its plant. Among the interesting testimonials which this company has recently received is one from F. B. Sheldon, chief engineer of the Hocking Valley Railway Company, at Columbus, Ohio. He says:

"In answer to your inquiry of the 27th, regarding the large steel rolling doors you placed on our machine shop and freight house in Columbus, Ohio, will state: These doors have given entire satisfaction. The mechanical construction is simple and first-class. We are specially pleased with the formation and construction of your slatting; its form gives great strength, and leaves no recesses to hold water and snow, which is an advantage.

"Prior to adopting your doors we used wooden ones hung on hinges at the side in the usual manner, and these were constantly being damaged by the switching of cars through them when not properly fastened open; this annoyance ceased altogether upon using your doors with the vertical lift. It gives us pleasure to recommend your doors to those who are in need of such construction."—Construction News.

TWO MILLION BARRELS OF UNIVERSAL CEMENT A YEAR.

When the Illinois Steel Company has completed its plant at Buffington, Ind., the total capacity of its works, including the plant at South Chicago, will be 2,000,000 barrels of Universal Portland Cement annually. The plant at Buffington will have a capacity of 4,000 barrels a day and is rapidly nearing completion. It will be one of the three largest cement plants in the world. It has sixteen rotary kilns that are eighty feet long and seventy feet in diameter. The machine shop is now finished, and the burner building is under way. Foundations for all the buildings will be finished in about two weeks. The new works will go into operation in July or August.

The Guaranty Cement & Stone Co., at 704 New York Life Bldg., Minneapolis, Minn., are the Northwestern sales agent, for the Universal Portland Cement, and will be pleased to furnish estimates to all contemplating the use of Portland Cement in any manner in this section of the country.

HANDSOME ART CALENDAR.

The Henry Sanders Co., of 77-85 Weed St., Chicago, Ill., are sending out a handsome art calendar illustrating the "Kolls Patent Lock Joint Columns," considered by most architects and builders as the very best columns now on the market.

The calendar also shows excellent half-tone cuts of many beautiful residences and pergolas in this country that are provided with these well-known columns. Some of the houses upon which they are used may be mentioned as follows: S. P. Shotter's residence, Savanah, Ga.; Allenhurst Inn, Allenhurst, N. J.; John A. McCall's house, Long Branch, N. J.; C. A. Ward, Evanston, Ill.; Paul O. Stensland's residence, Irving Park, Ill., and Franklin Hall, the Dayton Soldiers' Home, Dayton, Ohio.

The Koll Patent Lock Joint Columns are invariably mechanically and architecturally correct. Catalogues and complete description will be mailed to all who are interested enough to write to the above concern mentioning the Western Architect.

THE NEW LIFE BOILERS.

The many excellent features of the Des Moines Manufacturing & Supply Co.'s "New Life" Heating Boilers, both for hot water and steam (which are built both brick-set and portable), and the "Pleasure," are now offered to the building public with the request that the merits of these boilers be examined into by all those who are interested.

We take pleasure in calling attention to the following special points of superiority as claimed by the manufacturers:

First—Their durability and safety.

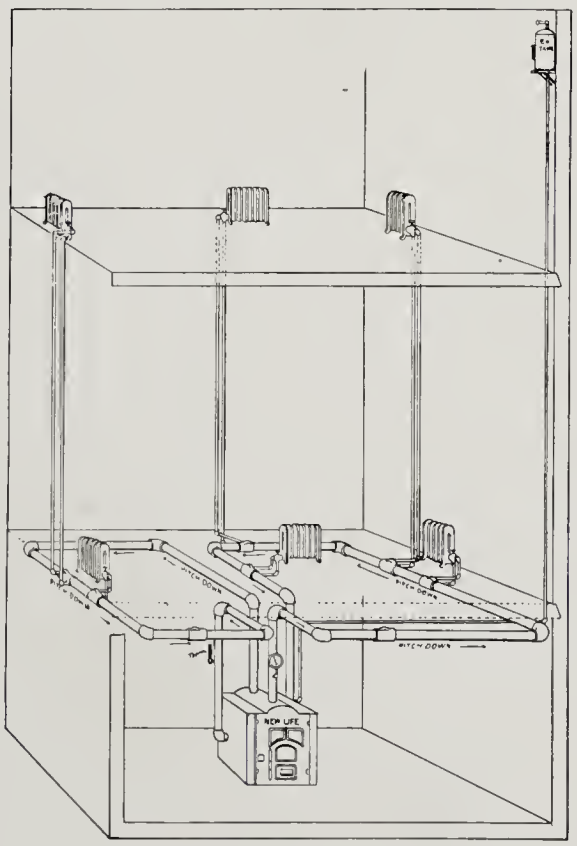
Second—Their economy in burning any kind of fuel.

Third—Their adaptability and convenience for any location.

Fourth—Their compact and neat appearance.

They are made of open earth flange steel 55,000 pound tensile strength, and all seams are riveted and calked tight. The top of crown sheet, top and sides of fire box are cylindrical in form. All angles are flanged rounding. All flues are expanded by the dudgeon process and are beaded tight to heads. All flanges are riveted to the boiler and tapped ready to receive water or steam pipes. The design is such that all mud or other foreign matter will settle below the fire at the lowest point, and all of the water in boiler can be drained out. There are no rust joints to leak or give out.

The boilers are so constructed that they will economically burn soft coal, slack, hard coal, coke or wood. They embrace all the valuable features of the locomotive fire box. The fire box is full length of the boiler, and is surrounded by water. In the front end of fire box a shaking grate is fitted, immediately back of which is a perforated stationary grate. In cleaning grates, the fire can be pushed back on perforated grate, avoiding necessity of putting fire out. The flues are all



NEW LIFE BOILER

located so that by simply opening doors in front they are accessible and are easily kept clean from soot and deposits, and thus a great saving of fuel is accomplished.

In these boilers the water circulation is vertical and very rapid, there being no impediment to the natural rise of hot water. There is no flat surface in a horizontal position for soot and ashes to accumulate on, as will be found in most boilers of other makes, and there is no brick work which comes in contact with hot fire to absorb the heat. Other minor features which add to the economy of the boilers, such as the position of the inlet or return pipes, the outlets and the introduction of hot air, the proper regulation of the damper, door, also check draft, etc., can better be appreciated when seen in actual use.

The boilers, having a low water level, can be packed in very shallow cellars or basements, and, as is the case sometimes, on the floor of the same rooms which are heated.

These boilers are built on the most scientific principles to give the best results, as may be seen from cut shown above. They are smooth and neat in appearance, the portable boilers not requiring any mason work or covering of any kind. In cases, however, where it is preferred to prevent any heat escaping in basement or boiler room, they can be encased with one single layer of brick, or a four-inch wall; or, if preferred, can be covered with asbestos cement instead of brick.

The Des Moines Manufacturing Supply Company will be pleased to mail to any one interested copies of testimonials from parties who are using their boilers, among whom are owners of the finest residences in Des Moines, as well as other cities.

EXTENSIVELY USED.

Few people outside of the regular contractors and builders realize how extensively crushed stone is used in buildings of the present time. With few exceptions, concrete of which crushed stone is the principal ingredient, forms the foundation and floors, and often the roofing is made of it.

The Langdon Stone Co., of Minneapolis, who are leaders in their line, are fortunate in possessing a sort of blue limestone that crushes into the most perfect shapes for all uses. While not so hard or so expensive as granite, it is hard enough to be equally as good, and it comes from a sufficient distance below the surface to be proof against all atmospheric disturbances. The Langdon people furnish this stone in sizes varying as widely as those of the best hard coal, and deliver it either separately or mixed. Their crushed stone has been used in the foundation floors and roof of the new Minneapolis Chamber of Commerce; the foundation vaults and floors of the new North-Western Bank Building and the foundation of the new Cream of Wheat building, besides being largely used in the make-up of the Glass Block addition. For street and railroad work this stone is in constant demand.

FLY TIME AT HAND.

The season is at hand when the house fly and other annoying insect pests appear. Sticky fly paper may be well enough in its way, but it only catches a part of the flies, and does not attract the mosquitoes and June bugs. The only sure way to be rid of the annoyance of flies and other winged insects, that have been proved by scientists to be not only annoying pests but dangerous carriers of disease germs, is to keep them out of the house altogether by screening the windows and doors. Cheap, makeshift screens are for sale, but little dependence can be placed in them, for they soon warp, twist and go to pieces, and it is poor economy to buy them. The only satisfactory plan is to send a list of your windows and doors, with the sizes, to some reliable manufacturer of window and door screens, or to their authorized agent, and get from them an estimate on what you require.

The E. T. Burrowes Co., of Portland, Maine, who are the largest and oldest manufacturers of window and door screens in America, have supplied about all the representative buildings—both public and private, throughout the country with their rustless window and door screens. Mr. D. H. Robinson, at 837 Guaranty building, Minneapolis, is the local Northwestern representative of the "Burrowes Rustless Screens," and he points with pride—as well he may—to the fact that he has placed these well-known screens for such people as G. F. Dean, J. C. Oswald & Co., J. F. Moore, J. H. McDonald, D. Bassett, Field's Flats, F. B. Long, W. C. Whitney, Minneapolis Club, J. H. Burton, Plymouth Clothing Co., R. D. Cone & Co., Groveland Flats, Home for Aged Women and Children, City Hospital, John Crosby, Elliott Wyman, F. L. Greenleaf, D. C. Bell, Zier Flats, and others who are the representative citizens of Minneapolis, and whose buildings are the best of their class in the city.

Architects generally specify and suggest their use for many reasons, among which may be mentioned one of supreme importance: that is, they are absolutely "rust proof," besides, they are always made to fit and the meshes are so small that the proverbial "gnat" can not get through them.

They are likewise the easiest screens to put on and take off that has ever been invented. Mr. Robinson will be glad to send complete catalogues and furnish any desired information to any one who will drop him a line at the above address, our readers in the middle and New England states, may write direct to the factory, stating that they saw this notice in the Western Architect.

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DEVOTED TO ARCHITECTURE AND ALLIED ARTS

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MR. F. D. MILLET and Mr. Douglas Volk are to be numbered among the artists employed to decorate Minnesota's new Capitol Building. The former is to paint "The Treaty of Traverse des Sioux," and the latter, "Father Hennepin Discovering the Falls of St. Anthony."

MAKERS of plumbing goods are not nearly so slow to see what is needful as are many others connected with building, yet the one-piece enameled iron sink was an unaccountably long time in following the one-piece enameled lavatory. As things stand now, most of the large makers still think the separate sink and back with the unsightly joint and the inaccessible bug-breeder and roost behind, are good enough for the public; but these makers will have to fall in line behind some of the newer houses. Architects have been clamoring for these one-piece sinks for years, with scant consideration for the sentimental attachments or whatever it may be, that leads manufacturers to cling with such stand-pat tenacity to their antiquated forms. It is more than a suspicion that this attachment is closely linked with the advertising investment represented in these venerable patterns, for it often happens that the smaller and newer houses who are not hampered with this investment are the first to cut loose from outgrown ideas and to introduce goods worthy of the times.

A WORD ABOUT OURSELVES.

THE WESTERN ARCHITECT has not said much about itself in these columns, and we shall not say much now; but we cannot refrain from stating a fact that of itself says a good deal. Last week we received over sixty new subscriptions, in additon to a number of renewals, and as each one is accompanied by a check for $5.00, we feel that our work is appreciated by the profession.

The Minnesota Chapter of the American Institute of Architects held a banquet at the Commercial Club, Minneapolis, on Monday evening, May 2, with members present from both St. Paul and Minneapolis. This was followed by a business meeting and general discussion of matters of interest to the practice of the profession in the Twin Cities.

We are pleased to be able to report a revival of interest in this chapter, which contemplates regular meetings from now on, the instructing of the younger members of the old chapter and a general elevation of practice. With 18 members of the old chapter, it is expected to soon have at least forty actively interested, which, if realized, will probably mean that instead of the silence of the past eight or nine years, when Minnesota's name was called at the annual meetings of the Institute, a creditable report will be read.

NAVAL architects and their good friends, the landsmen, the contractors for battleships, are getting little joy and much worry from the war thus far. These patriots have succeeded in getting tremendous appropriations for big battleships of late years, and now that one after another of these monsters, after a harmless existence, suddenly seeks the bottom, undone by some active little "destroyer," our patriots raise something very like a wail and protest against the use of "sub-marines" at least. They haven't quite enough assurance to cry out against the surface craft, with which the Japanese appear really to have done their deadly work, for the building of these surface craft has, in a small way, in times past, helped to keep the wolf from the door. But in these days of $7,000,000 battleships the building of torpedo boats hardly begins to satisfy the patriotic longings of ship builders, so that the operations of Admiral Togo and his men are emphasizing the shortcomings of the battleship in a way that hurts. If he sinks many more of these absurd monsters, he will spoil the business of building them. They may represent what is really needful in modern progress no more truly than does the sky-scraper of our large towns, but the sky-scraper does not "turn turtle," at any rate.

Efforts to effect a consolidation of the Massachusetts Institute of Technology with Harvard do not appear to abate, and late reports indicate that the Harvard authorities are hopeful of ultimate success. One can see how Harvard should be eager for the accession even at the cost of a considerable endowment for the "Tech," and how under wise management the merger might have an improveed scientific school as an outcome; but it is also easy to see how the "Tech," as a part of a University, might lose a good deal of its present prestige. The Institute authorities may well canvass the position occupied by technical colleges in other universites and compare the output of such colleges with that of independent technical schools before coming to a decision. A careful canvass of this sort will not be favorable to the idea of consolidation. University authorities are constantly trying "to make one hand wash the other" in educational matters. Having a notion that unpopular departments need bolstering up, courses of study are continually being arranged so as to support these departments. Thus it happens that students, particularly in scientific and technical branches, are continually made to do much work which they—and their proper instructors—regard as a waste of time. Some medical students of a large university, lately complaining to one of their most popular professors that their rhetoric instructor compelled them to write about lilies-of-the-valley, were answered: "Rats! You may write about senna leaves for me, but that is all I can do for you." And the last part of the sentence was really a long ways from a joke. It is this tendency of the great university that gives the correspondence school an opening, and it might be added creates a condition under which the correspondence school graduate often shows to such advantage. It is a tendency hard to suppress at all times, and which, if not well curbed, is always exercised at the expense of scientific and technical departments. The courses at the Institute itself have become so loaded of late years with studies having only the most remote relationship to the proper needs of the technical student as to cause much hesitation about entering the school and doubtless to deter many from registering. Friends of technical education may well ask whether this tendency would not be exaggerated were the school to come under the wing of Harvard. It is a tendency which doubtless has much to do with a phenomenon which is giving some alarm to faculties of the older universities—the falling off of attendance, relatively if not absolutely. Western schools are attracting a constantly increasing proportion of western pupils, possibly because they confine their teaching more nearly to the needs of the pupil as well as because of improved equipment and instruction.

Advertising is chiefly chargeable with the existence of some scores of preparations of uncertain character, mainly made from cereals, which pass by the general name of breakfast foods—which sell all the way up to ten times as much, weight for weight, as good old-fashioned flours from the same cereals—which are "predigested," perhaps, and generally directed to be further made by sweets and milk into slimes that tempt small folk to breakfast from the spoon, without the healthful mastication and salivation ordained by nature—which send the said small folk from the table half fed, with pains in the equatorial parts and leave them in dolour for the day and with badly developed digestive tracts for all time.

Now, a tale is told accounting for the parentage of one of these degenerate foods which may not be altogether true, but of a truth is not altogether improbable. Everybody sees everywhere cheap publications called magazines, wherefore it follows that such are much sought by advertisers, in order that the name and fame of their wares may be seen of everybody. The tale is this—a moneyless genius, seeing all manner of breakfast foods selling, and by what means, conceived a "community of interests," proposed in fact to the managers of several cheap magazines this "proposition": they to take $50,000.00 in stock in a new breakfast food, and to pay for it with advertising; he to furnish the name and any other trifles necessary, such as a miller who would contract to make the stuff, a printer who would provide labels, etc. There may be more partnerships of this sort. Who knows?

The great Russian painter, Verestchagin, who lost his life in the explosion which sunk the battleship Petropavlovsk at the entrance to the harbor of Port Arthur, was in his 62d year. He entered the Russian navy at the age of 17 years, but saw no naval battles while in the service. He studied art with the late Jean Leon Gerome, whose methods of painting seem to have made little lasting impression upon the pupil. Verestchagin showed plenty of versatility in his work, some of his paintings of architecture, mainly oriental, bringing unstinted praise from discriminating people, although as a rule the professional critics bore down on him pretty hard. This was to be expected when his freedom from the conventions of the craft is taken into account; but in fact he could turn off a masterly piece of work when he chose. Some of his many paintings of the Taj Mahal are cited in proof of this. One of his pictures, "The Forgotten Soldier"—"a vast wilderness of mountains in clouds and over the clouds a hovering vulture," leaves it to the imagination to make the title good. But again he treats his themes without concealment, with a realism reminding one at once of the writings of Tolstoi. So much of his work was devoted to picturing war and its attendant horrors as to give color to the widely held belief that he painted with the purpose of arousing sentiment against war. It is told that the late Czar, on seeing an exhibition of his paintings in St. Petersburg, exclaimed, "This man is a revolutionary," and that Verestchagin was invited to call next morning at the Department of Justice, but that instead of doing so he improved the interval in reaching the frontier, beyond which he remained until some three years ago. Upon his return to Russia he is

quoted as saying, "I am in no danger,—the present Czar is a humane man, and I only paint what I have seen, not what I imagine."

Nothing could differ more widely from the art of Verestchagin than do the war pictures of the Japanese. It will be recalled that shortly after the war with China some five years ago, the Japanese stores in this country displayed—not always for sale—pictures of the war, mostly prints. These pictures showed sometimes considerable European influence, but whether this was prominent or whether the treatment suggested nothing of it, one might look in vain for evidences of slaughter. A scene might show a tremendous naval struggle, prodigious valor in evidence everywhere, with nobody hurt as yet. The action was always so well represented as to fill the mind and take the attention from the absence of carnage. Whatever may have been the motives of the artists, this ghastly feature of European pictures was absent.

PHOTOGRAPHING ARCHITECTURE.

PART THREE.

Amateurs should not take the formulae of American makers of plates and commercial papers too seriously. The imported formula is apt to be more legible as well as more scientific. Many of them come from countries not blessed with two or three sizes of ounces or drams, and often one is seen which appears to have been the result of intelligent experimenting. American formulae instead of being given in definite proportions, probably require ounces of this, drams of that, and grains of the other. If the amateur can weigh the grains or obtain the requïred quantities from solutions of known strength he is in luck so far. For the rest he is very likely left to guess what kind of measure was used by the author of the formula. He is lucky if he gets directions as to whether anhydrous crystals are to be used or not. The writer at one period passed through the ordeal of using "pyro" developer for plates. Finding so great a diversity of directions among plate makers he averaged a half dozen or so and here is the result:

Pyro proportions, average of several plate makers formulas. Anhydrous alkalis.

Stock solution A.

Pyrogallol, 30 gr. Water 1 oz. Sulphuric acid, trace.

Solution B.

Sulphite soda 90 gr. Water 1 oz.

Solution C.

Carb. Potash or soda 60 gr. Water 1 oz.

Take equal parts of A, B and C and three or more parts water.

While on the subject of plate developers a combined developer is given herewith that has come to be known as the "standby" among the group with whom the writer works. They use it, varying the proportions of the developing agents, for nearly all plate and film work, including copying and lantern slides.

The eikonogen is relied on to take care of the detail, the hydrochinon to give force and contrast. This developer is a trifle slow after some use, but the old will be found to be admirably restrained for over-exposures.

THE "STAND-BY."

Eichonogen 20 gr. Hydrochinon 40 gr.

Sulphite of soda 120 gr. (anhydrous).

Carb. potash or soda 160 gr.

Water 16.02.

Many trials with metol in combination with hydrochinon has led us to give it up entirely for plates and films, but the combination is very useful with developing papers, particularly when not too fresh.

It is to be remembered that a trace of bromide of potassium is usually necessary in developers for papers, and also that the "hypo" in which they are fixed must be acidulated—both alum and acetic acid should be used.

Old-time photographers and amateurs tell of saving from the baths the valuable metallic salts held in solution, but little is heard of such economies in these times. These waste solutions have a certain value, however, as some of them are excellent disinfectants—those containing "hypo" in particular will be found efficient in cleansing a sink or waste-pipe in need of such treatment.

A few solutions used in photography are violent poisons to some people, while curiously enough only a very few are affected by them. The writer has known two people who were as sensitive to a certain platinite toning agent as are some people to poison ivy. The developing agent "metol" was early said to be poisonous to some, but there appears to have been so little foundation for the rumor that it seems to have run its course. This developer is of great value in making prints on developng papers, and it is claimed to be able to develop shorter exposures than any other. This is possibly true, but for making negatives from normally exposed plates many other agents are more desirable.

Photography is so much a child of the light that, naturally, skill in lighting for exposures takes first place among the requisites for getting successful negatives. Makers of hand cameras are wont to launch their victims upon the unknown tide with a few general directions, leaving much for discovery.

These directions are of use, perhaps, to those who never get beyond the snap-shot stage, but they are often misleading to those who make a more thorough study of photography.

Outdoor lights vary so greatly that the most promising amateurs will spoil many a plate in gaining skill in exposing. Not only are there bright days and grey days, but the angle of the sun from the horizon has much to do with the photographic activity of light. This activity falls off surprisngly at the ends of a day. At lat. 45 degrees a plate will need, say five times the exposure at midday of a bright December day that it would need in a bright June day. In photographing architecture out of doors there is the still further complication in colors of materials. Red bricks in a somewhat confined postion will take more exposure than the novice will be apt to believe.

But is is to interiors we look for a test of skill in exposing. At times windows must be taken into the field which give a thousand times the light reflected by other objects necessary to get. No non-halation plates are sufficiently potent to overcome the difference, but it may be possible to close the windows during the greatest part of the exposure, then close the camera, open the window and expose a trifle more. This trick is sometimes carried so far as to darken a large window in the center of the field and by long exposure secure a good interior, then cover the lens, uncover the window, change the focus to the proper distance to show the landscape through the window, and then take a "snap shot" at that. Of course, the objects in the room will not during this short exposure coincide on the plate with the same objects already photographed during the long exposure, but the exposure for the exterior is so short comparatively that no harm is done to the interior in the interval.

As a last resort the mirror may be used to bring out dark parts of interiors. Flash lights are to be avoided if other methods will answer; but if used they should be mellowed in effect by placing sheets or other large reflecting surfaces so that they will have the effect of enlarging the source of light. Never forget that flashlights are dangerous and that they leave a disagreeable ash. It is also easy for ladies to believe that they kill house plants. Nothing is easier than mistaking the amount of flash needed for a given exposure.

Distance and dark surfaces absorb this light after their kind. An early experience of the writer taught how to value written directions for making flash lights. A room with much deep red decoration was to be photographed, and it was desirable to place the camera in an adjoining room at C. Then according to stock directions the flash was made at f "a little above and behind the camera." The developing of the plate brought hardly anything—except some thinking. Although belated, the thinking led to placing the flash for the next exposure at f2, with plenty of white reflecting surface back of it, when an amount of flash that had been valueless at first did the work the second time with satisfaction.

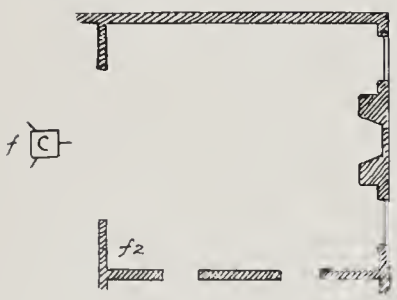


Fig. 1.

He who would photograph buildings with good effect will find enough obstacles to make the acquisition of really satisfactory negatives quite interesting. If he goes forth equipped with lenses and plates calculated to meet any case, he is as apt as not to find an unsuitable light, or he may find some obstacle in the way of a good view. Again, he may be obliged to use a lens of a focal length not altogether suited to the effect desired. Often in street work he will find it necessary to use a lens of too little focal length for good effect, but sometimes just the opposite will be true, as was the case with the photograph of the very interesting little church in St. Paul shown in Fig. 2. In order to make the best picture of the

FIG. 2—BETHLEHEM CHURCH, ST. PAUL, MINN.
Cass Gilbert, Architect

church itself at the time it was taken a point was selected where a lens with focal length about twice as long as the plate could be used. But the atmosphere was as clear as possible, so that objects on the distant bluff are entirely without the haze that would have distinguished them under more favoring conditions. Had a lens of less focal length been used from a position nearer the church, the church might have been shown the same size, and these distant objects would have been correspondingly reduced, much to the advantage of the picture.

In Fig. 3 is shown another St. Paul church, like the first, designed by Mr. Cass Gilbert. This picture is taken in a less brilliant light, and like the other, with a view not only to give an impression but also to record as much of the architecture as possible in one view. Here also a long focus lens is used, much to the advantage of the picture in this, that had the view been made from a nearer point, the gateway would have assumed undue importance compared with the building itself. Either picture might have gained by the substituion of color sensitive plates for the common plates used.

The Wisconsin Capital Improvement Commission are asking for plans for a new capital building that will cost $4,000,000 from Cass Gilbert, of New York and St. Paul, Ferry & Class and H. C. Koch & Son, of Milwaukee. The person or firm submitting the plans considered best will receive $2,000, the second best $1,500, and the third best, $1,000. Each competitor is also to be allowed $500 for expenses and time in examining the grounds and the plans must be submitted by Nov. 1st.

ALASKA BUILDING, SEATTLE, WASHINGTON.
Eames & Young, Architects, St. Louis, Mo.

RESIDENCE OF MORTIMER H. BOUTELLE, MINNEAPOLIS, MINN.
James Alan MacLeod, Architect, St. Paul, Minn.

RESIDENCE OF GEO. CADY, ESQ., CLEVELAND, OHIO.
Meade & Garfield, Architects, Cleveland.

GUTHRIE COUNTY HIGH SCHOOL, PANORA, IOWA.
Hallett & Rawson, Architects, Des Moines, Iowa.

RESIDENCE OF C. A. BROCKETT, KANSAS CITY, MO.
Root & Siemens, Architects, Kansas City.

RESIDENCE OF GEORGE W. FREEMAN, ST. PAUL, MINN.
Cass Gilbert, Architect, New York and St. Paul.

PRESS BUILDING, CHICAGO UNIVERSITY, CHICAGO, ILL.
Shepley, Ruttan & Coolidge, Architects, Chicago.

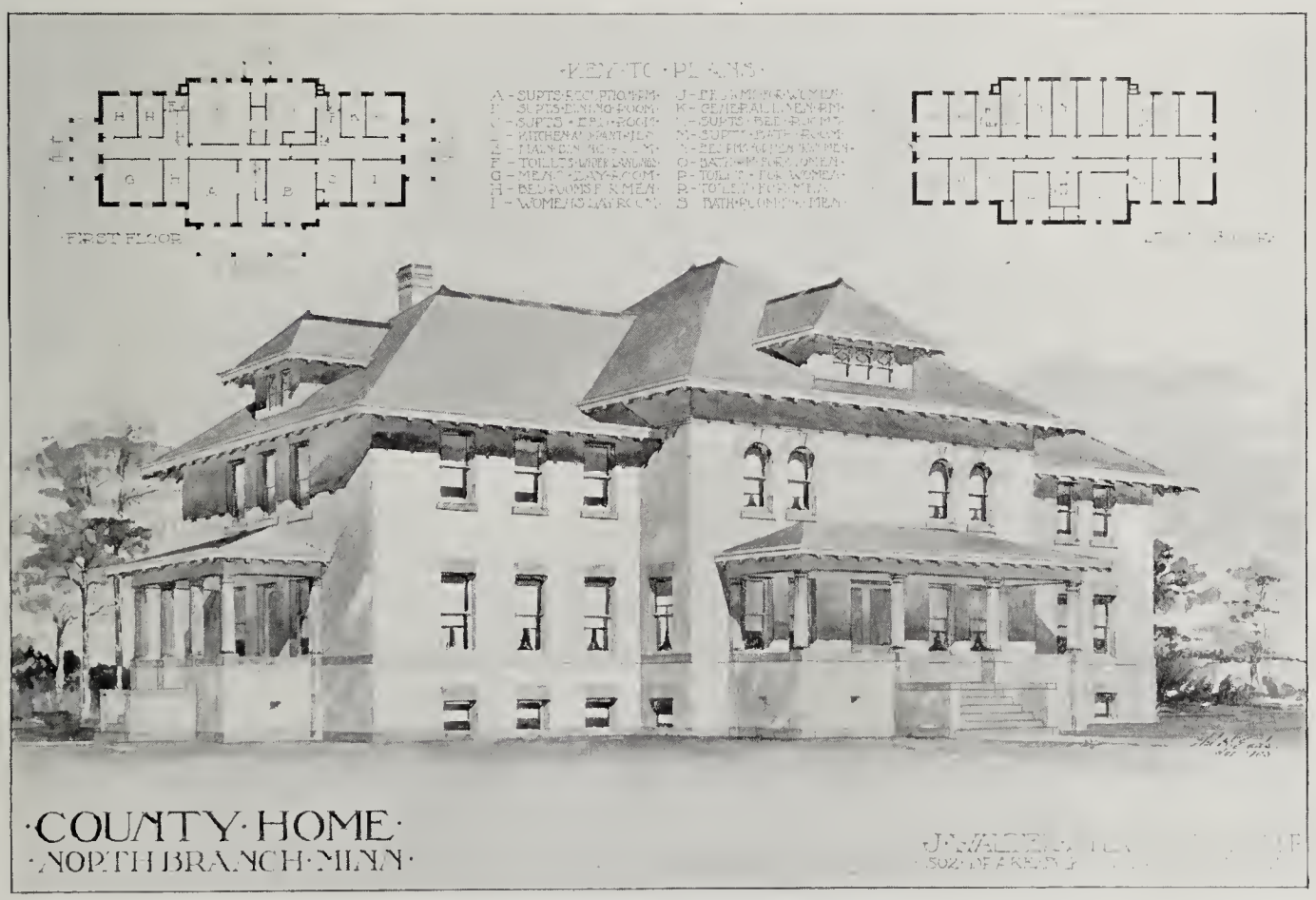
A BIT OF INTERIOR, SHOPS AND CRAFTSHOUSE,
John S. Bradstreet & Co., Minneapolis, Minn.

FIREPLACE AND MANTEL IN SHOPS AND CRAFTSHOUSE OF
JOHN S. BRADSTREET & CO., MINNEAPOLIS, MINN.

BRYANT SCHOOL BUILDING, MINNEAPOLIS, MINN.
E. S Stebbins, Architect, Minneapolis.

SKETCH OF ST. STANISLAUS PAROCHIAL SCHOOL, ST. PAUL, MINN.
E. J. Donahue, Architect, St. Paul.

Fig. 3—ST. CLEMENT'S EPISCOPAL CHURCH, ST. PAUL, MINN.
Cass Gilbert, Architect, New York and St. Paul.



COUNTY HOME AT NORTH BRANCH, MINN.
J. Walter Stevens, Architect, St. Paul.

RECOLLECTIONS OF BOSTON.
COPLEY SQUARE.

By E. P. Overmire.

In "Boston Town," a book published about 1880 by Horace Scudder, occurs the following words: "One of these days a person standing on Trinity (Copley) Square, will be able to see Trinity Church, The Museum of Fine Arts, The Museum of Natural History, the Institute of Technology, the Public Library, the Art Club, the Normal Art School and the Medical College." That day has long since passed. Copley Square now ranks first amongst Boston's parks as an attraction for the artist and student.

Although named as a park very recently, for the purpose of controlling the height and character of buildings that should bound it, the unique scheme presented for a sunken garden here would have given it note above that of any park of similar area in the whole country; it is quite possible that this scheme may yet be utilized. Triangular in shape and of very limited area, this square is a most refreshing spot to visitors and pilgrims, coming as they do from all civilization, to behold Boston's great literary and artistic treasure houses.

TRINITY TOWER

After passing the Common and Public Garden, one block out on Boylston street, comes the Lowell Institute and "Tech" buildings, and the Y. M. C. A. At the corner of Clarendon and Newbury (one block to the west) is Richardson's artistic Trinity Rectory, in which the great and good Phillips Brooks lived for many years. A little tale will illustrate the place which this building and its tenant occupied in the affections of the people. Two ladies, looking for the Art Club (which is a block further out) rang for admittance at the Rectory, to see an exhibition which was then on at the club. They were admitted and shown over the house by the ever patient and courteous rector, took in its art treasures and did not learn until about to leave that they had made an error and had imposed upon the good man. (A bachelor, too.) With profuse apologies they explained and were so heartily forgiven and asked to come again, that their own pleasure was exceeded only by that of the good bishop, who enjoyed their discomfiture most keenly. This incident was lovingly commented upon by the papers and people at the time.

TRINITY CLOISTER

At Clarendon street Huntington avenue branches off from Boylston street, and here one encounters the magnificent Trinity Church, which faces Copley Square, but is equally satisfactory from every point of view. Across the Square is the classical Public Library, to the left stands the Museum of Fine Arts, to the right of the library is the New Old South Church, one block further to the right is the Art Club, and on Boylston street are the Second Unitarian Church and Chauncy Hall School, while beyond the library are the Athletic Club and the Normal Art School.

TRINITY CHANCEL

Copley Square, as before noted, is the center of the literary and artistic life of Boston. It is accessible from South Boston via Dartmouth street, the only cross street (except Berkeley) until one reaches West Chester Park, some ten or twelve blocks further out. At certain hours of the day this square reminds one of a new Latin Quarter, the student element predominating in the throngs hurrying, some towards "Tech," some to the Normal Art School, or the Cowles Art School; besides these are the thousands of school boys and girls headed for the numerous Back-bay and South End, the Latin and English High Schools. In addition to all this the new buildings of the Horticultural Society, the new Symphony Hall and New England Conservatory farther out draw their throngs. One can thus easily understand the assertion that Copley Square is the great nerve center of literary and artistic Boston.

To adequately describe the wealth of beauty which adorns this square would be an arduous undertaking for any one. One feels compelled to begin with Trinity, both because of its being a pioneer here, and because of its artistic success. Every architect knows its history; my illustrations will tell more in one minute than I could in an hour of effort, so I will let them tell the beautiful story. The stone window tracery set into the cloister walls came from England and has a history. The front, now complete, was finished about ten years ago by Shepley, Rutan & Coolidge, who have faithfully developed the porches and towers in the true Romanesque spirit of their predecessor; it is very satisfying. The great mass of the central tower dominates the entire Back-bay district and is a most noble

NEW OLD SOUTH CHURCH

and masterly conception, exciting the admiration of foreign and domestic visitors alike. The only criticism that I have ever heard was upon the interior of the church, and pertained to the seemingly unnecessary exaggeration of the structural members of the central tower and above the choir, which are unpleasantly in evidence and could probably have been dispensed with. La Farge's decorations and the glass unite to give to the interior a most pleasing, religious expression, satisfying to the laity and the clergy alike. The view of this church from the Northeast is perhaps as satisfactory as any of the building.

The Museum of Fine Arts is of an entirely different class, pseudo-gothic in style. It is not a very satisfactory building to the architectural mind, but has served a worthy purpose and might easily have been very much worse, which may, possibly, be called "damning with faint praise." It was the first building in the United States where ornamental terra cotta was extensively used, this having been imported from England. One writer has expressed the idea when he said, "The Museum of Fine Arts lifts its dear, familiar, hideous facade on the south side of the square, where kindly ampelopsis in summer hides most of the brick and terra cotta.

The New Old South Church is Florentine in feeling, particularly its tower. It was built shortly after the great fire in 1872, which stopped just before reaching the Old South building and led to its abandonment and the construction of this building in Copley Square. It is of Caen stone. The tower is 235 feet high and has a slight "lean," due to settlement in the foundation, which is not surprising when one knows that all this district is "made" ground. Sitting beneath the huge copper lantern, the writer heard an eloquent sermon by the Rev. Geo. A. Gordon. The interior is somewhat impressive, but suffers in comparison with its neighbor on the opposite side of the square.

THE PUBLIC LIBRARY

The new Public Library is the youngest of the notable structures bordering Copley Square, and naught but praise can be spoken in her behalf. While pardonably prejudiced, the writer feels assured of general support in classifying this as "the noblest Roman of them all." It is a building that appeals only to the cultivated mind. Your hustling tourist would not spend five minutes in studying its exterior, but to the cultivated mind it is worth going a thousand miles to study. Conceived in the best of Italian Renaissance, feelingly proportioned, refinely detailed, its ensemble enthralls the artist, just as a great musical climax, or a great orator's eloquence masters one. It breathes the

spirit of devotion to high ideals, and is an object lesson of what can be accomplished through consistent fidelity to a high conception. Internally it is a constant succession of pleasing sensations, beginning with the vestibule and entrance hall, the noble staircase with its great leonine memorials of the officers and men of the two Massachusetts volunteer infantry regiments and its noble arcade and coffered ceiling; Bates' Hall

LIBRARY STAIR CASE

with its impressive scale and splendid marbles and furnishments; Delivery Hall with Abbey's paintings of "The Search for the Holy Grail," and Sargent's paintings in Staircase Hall on the third floor, illustrating "The Triumph of Religion." This is the Special Library Floor.

BATES' HALL

The Court is done in Pompeian brick and terra cotta, with Milford pink granite for the colonnade, which runs around three sides. The Stack Room occupies the rear of the building and will accommodate over one million volumes. This building cost over two million dollars.

An idea of the care exercised by the architect in studying his proportions for this building is had from the fact that when it had reached Bates Hall level (the string course immediately above main entrance) he had a full sized model of the cornice erected at full height on a staging at one corner, and from this model made his final design for this important member This gave rise to a report that the building was to be completed above that level in wood because of a lack of funds to continue it in granite, which was, of course, an absurdity, but was seriously reported by the newspapers at the time. Any person who saw the design of the library building which was actually commenced here (which was repudiated and the work already done blown out) cannot but feel that the reputation of Boston as a center of art and culture was in the balance, and but for vigorous action of the committee in charge would have suffered for all time to come.

TRINITY CHURCH

The construction of the present building has given to Boston world-wide fame, likewise to its architect. It is to be hoped that the scheme for a sunken garden in this square may be realized soon, as it will enhance immensely the effect which the Public Library exercises over Copley Square.

COPLEY SQUARE AS IT IS

ART AND ARCHITECTURE.

Whether or not an architect is an artist is a question that has recently been troubling the board of appraisers of New York. Judge Somerville has finally handed down a decision declaring that he is.

The test arose over the case of Arthur Bohn, an architect and an American citizen, residing temporarily in Europe, who submitted a design for an art museum for the city of Indianapolis. The preliminary sketches presumably made in America, impressed the committee of the art associaton favorably and won acceptance. The pen and ink drawings, made abroad, came along in due time, and were assessed 20 per cent under the regular tariff schedules. The law was very plain, in fact "pen and ink sketches" appeared word for word in the paragraph covering the case. It looked as if the duty would have to be paid.

One loophole appeared. A later paragraph places on the free list "works of art, the production of American artists living temporarily abroad," and under this an appeal was made. Had the object assessed been an oil painting or a piece of statuary there would have been no room for doubt. The question was, whether or not a pen and ink sketch, clearly not a work of art in the sense of being striking enough or beautiful enough to be used as an article of virtu, an object of decoration or adornment, but representing the guide work to the construction of something very beautiful, and containing within itself the essence of art, representing the patient labor, and embodying the plans and ideas of a man of artistic temperament and high ideals, is or is not a work of art. The court holds that it is.

This decision will please every lover of architecture in the country. It is not that the architect cares anything about being told that he is an artist. This he knows, just as he knows that it is not given to every architect to be a great artist, nor to every painter or every musician. The gratification will come from the sense of being appreciated, from the knowledge that there are men outside the profession and unfamiliar with its technique who have, nevertheless, the discernment to place the work of an architect where it belongs, and grasp the fact that in designs or sketches not essentially beautiful in themselves there may be embodied as much of artistic effort as in the picture or the statue, the architect's designs often standing for his ideals in much the same way that the notes on the printed sheet stand for the symphony conceived by the musician.—Minneapolis Journal.

A great architect with the pen—that is, one who seems called upon to write upon the subject on account of the absence of commissions, has in his dearth of ideas called attention to the complications between architects and owners and also says something about the general reputation of architects from a business standpoint, a lack of thoroughness in their work and attention to details which prove expensive many times to the owner and the consequent difficulties arising therefrom. This matter was touched upon a few days ago by a well known practitioner, in which he said that a client who had expended many hundred thousand dollars in building had told him this was the first time that he had got through with an architect with perfect satisfaction on both sides, and there had not been some dispute about extras or commissions. The question was asked the architect why this was so, and he replied that this is not only true of the architectural professions, but of other professions. His experience in his own profession was that as soon as an architect had got through his immaturity, through his adherence to theory, rather than practice, and was capable and able to give the client value received, he immediately began to neglect his work to take up golf or go yachting, or indulge in social excesses which interfered with his success. He was given to staying too long at the club, believing that "the boys" in the office could attend to that which in many instances had cost the client many hundreds of dollars through slight inaccuracies and errors in the work. He thought more of them would make a success in the profession if they would adhere more closely to their business. "The boys" in the office do the best they know how, and on most occasions do their work accurately, but there are times, as most every architect has discovered, that a trifling error overlooked in the plans often costs the owner much money and is the course of great dissatisfaction upon his part. It is only practical application through long years of experience that men are enabled to discern intuitively where the trouble will come and the work can no more go along without their attention than anything in the world. It is just at this point, said the young architect, that attention is necessary, and, furthermore, it is this kind of attention that reflects credit upon the architect as well as brings him commissions.

The modern merchant who never advertises escapes a lot of trouble. He may keep out of some of it without intending to do anything of the sort, but he escapes it just the same. He gets rid of the trouble of preparing advertisements, and, of course, has no worry about changing them and keeping them fresh and up-to-date. He is not bothered about the way his advertisements are printed, nor the position they occupy. He can say, with much truthfulness, that it is no trouble to show goods, for he is seldom asked to show any. But his greatest saving of trouble is in not having to sell goods to people who stay away, but who would come to his store if he advertised. Then, as he sells few goods, he has few goods to buy, and there is more trouble saved. He never has the trouble of selecting and paying a large staff of assistants. He gets rid of the trouble of having to pay for advertising. Finally he never has the trouble of enlarging his store, or of removing to a bigger one, and it is very little trouble to count his money. Strange, what a lot of trouble a merchant makes for himself by advertising.—Retailer and Advertiser.

PAPER READ AT THE MEETING OF THE TWIN CITY ARCHITECTURAL CLUB APRIL 15TH, 1904.

By R. T. Giles.

A stained glass window is itself the best possible illustration of the difference it makes whether we look at a thing from this side or from that, and is alive with meaning and color only when we view it from the interior. White glass would seem to have been known to the Chinese 2300 B. C. Historians tell us that the Egyptians made jewels of colored glass five if not six thousand years ago. It is more than probable that this was the earliest use to which stained glass was put. In some of the most ancient tombs have been found scarabs of glass in deliberate imitation of rubies, sapphires, emeralds and other precious stones.

The Greeks and their Roman successors made glass in imitation of agate and onyx and all kinds of precious marbles. They devised also colored glass coated with white glass which could be cut cameo fashion, a kind of glass much used, though in a different way, in later medieval windows. So far, however, glass was used in the first instance for jewelry and in the second for vessels of various kinds. Its use in architecture was confined mainly to mosaics originally, no doubt, to supply the place of brighter tints not forthcoming in marble.

Of the use of glass in windows there is not very ancient mention. The climate of Greece or Egypt and the way of life there, gave scant occasion for it. But at Pompeii there have been found fair sized slabs of window glass not of very perfect manufacture, apparently cast not very translucent. Remains also of what was presumably window glass have been found among the ruins of Roman villas in England. In the basilicas of Christian Rome the arched window openings were sometimes filled with slabs of marble in which were piercings to receive glass, foreshadowing, so to speak, the plate tracery of early Gothic builders.

The windows of early medieval Flemish churches were often filled in this Roman way with plates of stone pierced with circular openings to receive glass.

Another Roman practice was to set panes of glass in bronze or copper framing, and even in lead. Here we have the beginning of the practice identified with medieval glaziers.

There is no reason to suppose that the ancients practiced glass painting as we understand it. Discs of Greek glass have been found which are indeed painted, but not with color fused with the material, and certainly these were not used for windows.

The very early Christians were not in a position to indulge in or even desire luxuries, such as stained glass windows. As St. Jerome made allusion to them, it is pretty certain that these must have been simple mosaics in stained glass unpainted.

Stained and painted glass may possibly date back to 800 A. D. It may safely be said not to occur earlier than the Holy Roman empire. There is one particular account of the furnishing of the chapel of the first Benedictine monastery at Monte Cassino with a whole series of windows in the year 1066, which fixes the date of the Norman conquest as a period at which stained glass windows can no longer have been uncommon.

It appears to be agreed that no complete window of the ninth or tenth century has been preserved. There is nothing that can quite certainly be identified.

The great mass of early Gothic glass belongs to the thirteenth century; and when one speaks of early glass it is usually thirteenth century work which is meant.

It is usual to confound stained and painted glass Literally speaking, these are two quite distinct things. Stained glass is glass which is colored in the pot—that is to say, there is mixed with the molten white glass a metallic oxide which stains it green, yellow, blue, purple, and so on, for which reason this self tinted glass is called pot metal. Pot metal is glass in which the color is in the glass and not painted upon it. A varied colored window could only be produced by breaking the sheets and putting them together in the form of a mosaic. That is how the earliest windows were executed.

In painted glass the color is not in the glass, but upon it, firmly attached by the action of the fire. A metallic color which has some affinity with glass is used as a pigment. The painted glass is then put into a kiln and heated to a temperature at which it is on the point of melting. By this means it is possible to paint a colored picture upon a single sheet of white glass.

Strictly speaking, stained and painted glass are the very opposite one to the other, but in practice the two processes of glazing and painting were never kept apart. The very earliest glass was no doubt pure mosaic. Painting was at first always subsidiary to glazier's work. After that for a time glazier and painter worked hand in hand upon equal terms. Eventually the painter took precedence and the glazier became ever more and more subservient to him. But from th twelfth to the seventeenth century there is little of what we call art glass, in which there is not both staining and painting. Painting is only used to give expression to the stained glass.

A generation ago the making of stained glass windows was considered a lost art. Today this art industry has attained a very high standard and has become very popular. Artists follow the old school today without any important variation from the methods of eight centuries ago.

We first find from the architect the desired space and shape to be treated and a design is made to the necessary requirements in a water color sketch to show the general design and color scheme. If this design should prove satisfactory a full size detail drawing is made to work from, showing exactly how the different pieces of glass will be cut and afterwards framed together with lead or metal, following the lines indicated on the drawing. Should the subject require the assistance of glass painting a cartoon is then prepared of the ornamentation or figure for the glass painter to work from, which is copied very carefully.

A transfer drawing is then made on heavy paper with each piece numbered so as to avoid any complication. This transfer drawing is then cut according to the lines indicated by a pair of three-bladed scissors, which leave between their parallel blades a space sufficient for the heart of the leads between the glasses, thus: 

These cut out patterns are placed over the glass selected by the artist according to his colored sketch and cut exactly the same size as the pattern. Should this glass require painting it is taken to the glass painter, who, after tracing his general outline in mineral color, fastens the several pieces to a glass plate with wax, which is put on the easel, it being necessary to have the light shine through so that the glass painter can judge his modeling in light and shade, and is afterwards fired in the kiln. Whether these pieces of glass are painted or not they are laid out on the detail drawing and the lead glazier twists the flexible lead around them, soldering each joint to make same fast. A special cement is then applied to make the whole water tight.

The window is now complete, ready to be placed in position, which is secured by copper wires fastened to transverse bars of iron to resist the wind pressure.

The principal glasses used in the manufacture of stained windows of to-day are antique, cathedral and opalescent.

Antique is blown glass in pot metal, and may be also flashed whereby one side would be red and the other side white or different combinations of colors, and is specially tempered for painting purposes. Antique glass is made exclusively in Europe.

Cathedral glass is rolled and is less expensive than antique or opalescent and is made in both Europe and America.

Opalescent glass is of American manufacture, and is made of such a nature that it will not permit of the use of paint and when subjected to the fire invariably turns dense and almost black. Opalescent glass makes a beautiful varied effect with its changing hues and powerful color. For drapery effects, they have a method of rolling molten glass flat and twisting the edges with tongs, which gives a wide variety of forms and depths of color. This material is often plated with several thicknesses to obtain the desired effect, and is best adapted for quaint or strong character draperies; also for strong powerful landscapes and mosaic effects and ornamentation.

Windows are made to-day following the different decorative motives of ancient periods to the most modern styles.

A famine in window glass is apparent. The window glass factories have not been in operation since last June, as the manufacturers have been haggling over selling rates and a wage scale.

Stocks have been reduced to a minimum. The Baltimore fire has created a demand for glass which can not be met if all the factories were to start tomorrow This will result in big importations from Belgium.

BRONZE ELECTROLIER FOR U. S. MINT, AT PHILADELPHIA, PA.

Designed and Executed by the Flour City Ornamental Iron Works. Minneapolis, Minn.

ELABORATE BRONZE WORK.

The above elaborate piece of bronze work is one of two pieces to be placed at each side of the main entrance to the United States Mint, at Philadelphia. The material of which they are made is cast bronze, and their separate weight is in the neighborhood of 1,000 pounds,

while their cost is about $2,000 each. It is not a little surprising to those who are unfamiliar with the magnitude, skill and responsibility of some of the representative manufacturing concerns of the "wild and woolly" west that such a fine piece of work emanates so far from the cultured and elite east, as the wax patterns, modeling, casting and finishing was entirely executed in Minneapolis, where the concern that made it employ only the highest of skilled labor. In the finishing of these pieces of beautiful bronze the whole surface was chased in the same manner a gold-smith might engrave a gold watch case, the chasing alone requiring the constant work of six men steadily for six months' duration to complete them. There are but few firms in the United States that could turn out so creditable work of this kind, and certainly none could excel them. It requires a great deal more of skill and care in the executing of such delicate details than the public can realize.

NEW COLLEGIATE BUILDING, AMES, IA. BY PROUDFOOT & BIRD

GREED AND CORRUPTION.

The testimony before the inquest into the Hotel Darlington disaster in New York repeats the depressing revelation of lawlessness due to private greed and official cupidity made in the Chicago fire inquiry. It will be remembered that the Hotel Darlington collapsed before it was finished and killed a large number of people. The secretary of the realty company testified with the utmost frankness that the plans on which the building was being constructed were not approved by the building department. It does not appear with certainty that any plans were submitted to the building department, though the original plans drawn by the architect were better than those afterwards substituted. The architect was instructed to plan the building in the cheapest possible manner. The plans made on these instructions were rejected and others substituted which saved thirty per cent in the cost of iron. These substitute plans were provided by the lowest bidder. This is the familiar game of making a low bid for jerry work, after plans as cheap as the law will permit have been adopted, and then surreptitiously changing the plans. There does not seem to be the least doubt that the building collapsed because it was not strong enough to stand. The owners and contractors violated the building law to save money and the building department let them do it, probably for a corrupt price. The natural remedy would be to put them all in jail; but that is not the American fashion.—Minneapolis Tribune.

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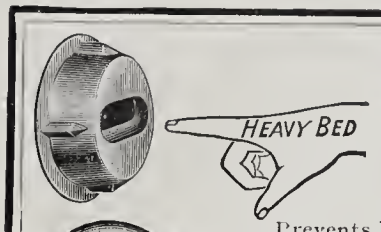

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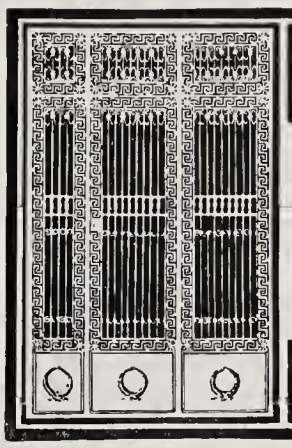

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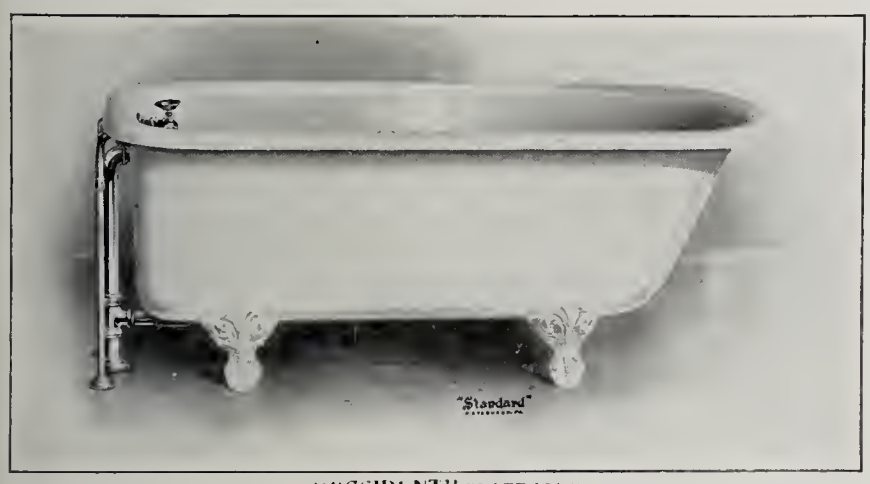

THE "OCCIDENT" PLATE 101 G

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OBITUARY.

Mifflin E. Bell, architect, Chicago, died on Tuesday, May 31st, of pneumonia. Mr. Bell was born in Chester County, Pa., and went to Illinois in his youth. When twenty-six years old he became superintendent of construction of the Illinois state capitol, and later was architect of the state capitol of Iowa. Before the latter building was completed, Mr. Bell was appointed supervising architect for the treasury department at Washington. He was then thirty-six years old, and the youngest man ever chosen to such a position. The architect served under President Arthur and Cleveland until 1887, when he removed to Chicago, continuing his work. Mr. Bell left a widow, two sons, Henry Van Hoff and Dillwyn M. Bell, and three daughters, Mrs. A. M. Jerrems, and Julia and Susie Bell.

MR. CLARKE MERCHANT, (DECEASED.)

A loss keenly felt in the business world, as well as to his hosts of friends and admirers all over the country, is that of Mr. Clarke Merchant, who died recently in Philadelphia. Ever since the war, Clarke Merchant has been engaged in commercial life, and through his industry and business integrity built up a business of great magnitude in the brass and copper product line. Mr. Merchant comes from a fighting stock, his grandfather, George Merchant, being a soldier in the War of 1812. His father was one of the first cadets to West Point and subsequently served in every rank in the army up to colonel, with which rank he was retired.

It was during his father's army service that Clarke Merchant was born, having come to light in Oglethorpe Barracks Savannah, Ga., September 30, 1836. He entered the United States Navy in 1854 as a midshipman and graduted in 1857. Before the Civil War he served in the Pacific ocean squadron. In 1860 he was promoted to the rank of master, and under that commission served on the sloop of war Germantown. When United States Minister Ward went to Pekin, Clarke Merchant was the executive officer on the steamer Toey Wan, on which the trip was made. During the bombardment of the Chinese forts by the English, on the Pei-ho river, he was present. Later he served on the Mediterranean squadron on board the Susquehanna, but returned to the Pacific squadron where he served as flag lieutenant and ordnance officer.

When the Civil War broke out, Mr. Merchant was transferred to the Atlantic squadron and served on the Roanoke as lieutenant. During the year of 1861 he was promoted to executive officer, and served with distinction as such throughout the conflict. About the close of the war he was promoted to the grade of lieutenant-commander on board the training ship Constitution, but resigned soon after and commenced a business career in Philadelphia, becoming a member of the firm of Carman, Merchant & Shaw, agents for the Pacific Mail Steamship Co., but later establishing himself in the tinplate and metal business under the firm of Clarke Merchant & Co., (Incorporated.)

This company distributes as great a quantity of brass and copper goods as any other metal house in the United States and all this insures the dealer and consumer bottom market prices and the promptest mill shipments.

Merchant & Co. are also manufacturers of babbitt metals solders, etc., and carry one of the largest stocks of brass and copper products carried by any single manufacturer or jobbing house in this country.

SPECIAL ESCUTCHEON AND KNOB FOR STATE CAPITOL HARDWARE.

The newspapers and the public have been disposed to comment on the slow progress of work on the new Minnesota State Capitol building. They do not realize the size and character of the structure. Those fully familiar with the facts are of the opinion that progress has been as rapid as possible, consistent with securing only the best results. The amount of work and material required in a building of this character is almost beyond conception, so far as the general public is concerned. One of the minor features is that of the trimming hardware, and a few statistics covering that detail are interesting and suggestive. THE WESTERN ARCHITECT is indebted to Mr. H. B. Gardner for the facts in this connection, and they certainly are rather formidable.

The principal quantities of the various lines of hardware for the four floors above the sub-basement are as follows:

Master keyed cylinder locks	377
Three bolt communicating locks	115
Three keyed pintumbler wardrobe locks	218
Special escutcheons with state seal, 4x20 in	144
Special escutcheons with state seal, 3½x12 in	195
Special escutcheon plain, 3x9 in	740
Special design knobs, 3 inches in diameter	84
Special design knobs, 2½ inches in diameter	886
Paracentric keys for cylinder locks	1,862
Ball bearing butts, 6x6 in	1,330
Ball bearing butts, 5x5 in	75
Ball bearing butts, 6x8 in	30
Five knuckle bronze butts, 4x4 in	226
Five knuckle bronze butts, 3x3 in	328
Five knuckle bronze butts, 2½x2½ in	220
Bommer spring hinges for marble	114
Bommer spring hinges for regular doors	48
Kick plates	80
Matchless floor hinges	48
Liquid checks and springs	181
Door holders	215
Lever flush bolts	84
Ball bearing window pulleys	1,000
Giant metal sash chain, ft	6,000
Special sash locks	250
Special sash lifts	500
Special sash sockets	250
Pull down hooks on poles	100
Howarth sash centers	180
Half flush transom catches	180
Bronze coat and hat hooks	950
Bronze drawer pulls	326
Taplin's patent stop screws and washers	12,096

The fact that much of this material is of special design of unusual sizes, makes the showing more notable. While it is what the men in the trade call a large bill of high-grade hardware, its cost is about one seven-hundredths part of that of the entire building, about $8,000.

Ten different manufacturers had a hand in the production of these goods, including some of the best known concerns in the country. The special design hardware was made by the Reading Hardware Co., from designs original with Cass Gilbert, the architect. The material is now nearly all at the building and is being put in place as rapidly as possible by the Gardner Hardware Co., of Minneapolis, who furnished the entire bill. They have also recently been awarded the contract for all the cabinet hardware for the telephone booths, wardrobes, etc.

PAINTS AND VARNISHES.

Painting and the parts of building operations usually carried out by painters, probably give architects five times as much annoyance and worry as any other like money expenditure that comes under their control. We have known architects of experience to declare that they had about made up their minds never to contract another piece of painting or hard wood finish, or, at least never to let work to any contractor whom they did not know thoroughly—that while they could form some idea of what materials were being used in any other department of building work, the ways of the devious contracting painters were past finding out—until he was paid off and it was too late.

If a supervising architect has ambitions as an amateur detective, he may take pride in coming up with a slippery contracting painter, but the ordinary architect does not enjoy taking samples of goods to an analytical chemist.

Architects of experience almost without exception have therefore come to rely upon the goods of certain makers of paints, varnishes, and the like, knowing that if the goods are used honestly and intelligently the chances of failure are slight.

In fact the business of manufacturing paints and varnishes is at present conducted more nearly according to wholesome trade laws, than that of most other building supplies.

There is wholesome competition among manufacturers, who apparently have access to a free market for nearly all their raw materials, and they place their finished goods on the market upon their respective merits at prices that enable them to keep up a high standard of excellence.

The retailer who wants to build up a reliable business can select among brands of mixed paints and varnishes, goods which he knows will fill the requirements if he can get them used without adulteration.

We may mention the Twin City Paint Company of Minneapolis, as a house that is trying to supply their large market with goods from houses who have reputations too valuable to risk by turning out questionable goods. Their leaders are Pratt & Lambert's varnishes and Lower Bros.' paints, which have made such an enviable record as to lead to their selection for painting such buildings as the Lumber Exchange Building and International Exposition Building, Minneapolis; White Enamel Refrigerator Co.'s factory, St. Paul; Mr. E. E. Fisher's residence, Lake Minnetonka; Mr. W. C. Pike's five houses, 612-20 East 25th street, Minneapolis; Court House, Minneapolis, and the Andrus Building, Minneapolis.

CATALOGUE OF FIRE-PROOF WINDOWS, DOORS, ETC.

With the possible exception of fire-proof wood, more attention is now being given to the question of window and doors, that are fire-proof, or would be fire-proof in the event of a fire, than any other item that enters into the modern building. We have been lead along these thoughts by the receipt of the St. Paul Roofing & Cornice Co.'s new catalogue of fire-proof doors, windows, etc., showing in halftone illustrations the tests of the fire-proof qualities of frames and sash fitted with wire glass. The test proved all that could be desired in defying the flames and in keeping the heat from penetrating to the inside of the test-buildings.

Another special feature of this catalogue are the illustrations of noted buildings which are equipped with Pruden's Patent Metal Sash and Frames. They include the J. B. Lippincott Co. building, at Philadelphia, the Marshall-Wells Hardware Co.'s building at Duluth, Foley Bros. & Kelly's large wholesale warehouse in St. Paul, as well as the large, new building for the Hibbard, Spencer, Bartlett & Co., of Chicago.

The catalogue also shows cuts of designs in detail for metal corridor trim and sash, as well as the automatic working of fire-proof windows. Take it all in all this latest catalogue of the St. Paul Roofing & Cornice Co., will give all information that is necessary for either architect, owner or contractor in the way of fire-proof doors and windows, and the company will be pleased to mail one to any person that is interested in these modern appliances, upon receipt of their name and address.

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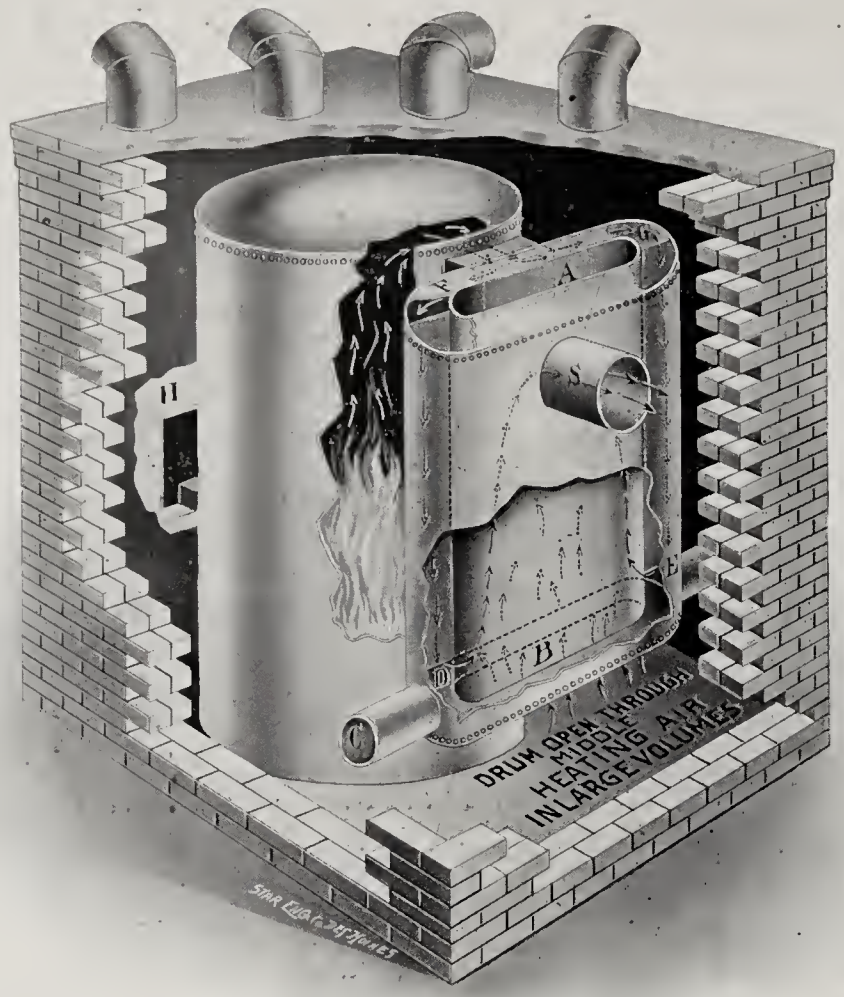
The cut following illustrates our new brick set furnace, which we make in three sizes. These furnaces are especially intended for school houses and large church jobs. The combination attachment for heating hot water radiators as shown in our 1904 catalogue on page 22, may be used on these furnaces if desired. A very fine system for school houses may be had by using hot water coils on the outside walls of each room, and a hot air register on the inner wall; the hot air to be conducted to the rooms by means of brick flues as is used where indirect steam heat is used in connection with a fan system. We furnish, when desired, with these furnaces, a battery of water tanks, which are placed inside of the brick work for the purpose of supplying moisture and retaining heat. There is no system of heating that will furnish as moist and balmy air as can be furnished with our hot air and combination furnaces by the evaporation of water in open tanks placed within the casing.



INSIDE CIRCULATION FOR RESIDENCE HEATING.

There is a feature in connection with hot air heating that a great many do not look at in the right light. That is the matter of ventilation, or inside circulation of air. It appears that the first thing a great many people think of, or demand, when they are approached on the subject of hot air heating, is that of an outside cold air duct. The same people, if approached on heating with hot water or steam systems would not think of asking for a cold air duct to be brought in from the outside. Some people seem to think that the cold air duct from the outside is an essential thing for the successful working of a hot air furnace. This is not the case. Much better results may be obtained by cold aid ducts from the inside or from the rooms to be heated. Much better ventilation will be secured by inside circulation of air with a hot air furnace than when heating with hot water or steam, as circulation of air is ventilation to a certain extent. A ventilating flue may be used with a hot air system and inside circulation to good advantage.

Mention of a good plan for a ventilating flue may be found on page 24 of our 1904 catalogue, which will be sent on application to The Lennox Furnace Co., Marshalltown, Io.; W. J. Heald, Manager.

THE PROPER EXECUTION OF INTERIOR WOOD FINISH.

It is a well known fact among architects that the proper execution of interior hardwood finish is one of the most important factors in connection with building, by reason of the fact that it is one of the items used in the construction which is part of the decoration of a home, and unless properly executed, is always a source of regret to the owner. Enough care and consideration in the correct method of handling of woods, as well as the workmanship on same, is very seldom given by factories who produce this work, and it is quite often the case that the question of a few dollars carries with it more weight than the consideration of the results which are desired. Architects owe it to their clients to secure for them the very best results obtainable at a reasonable cost, and in this connection the quality of work should be, if anything, more fully considered than the price. The proper execution of interior finish should be given very careful consideration, and the work should always be entrusted to concerns whose ability to properly furnish it, and whose reputation for first class work is unquestionable.

In line with this statement, we wish to call attention to the Farley & Loetscher Manufacturing Company of Dubuque, Iowa, which is probably the largest concern of this kind in the country, and whose reputation, being of the very highest, has stood the test of years. Their operations are on the very largest scale, and one which finds a market for its output throughout the country. This company owes its prominence not only to the extent of its operations, but fully as much to its wide reputation for beauty of material and superb workmanship embodied in its hardwood interior finish, which may be seen in many of the most costly and elegant, private and public buildings in the country.

It is a pleasure to this journal to be able to give this information, which will be a great interest to every one employing this class of material.

A CREDIT TO THE NORTHWEST.

While the industrial growth of the Northwest has been almost phenomenal, it is not everyone that is familiar with the full development of this rapid growth. There are many concerns doing business in the Twin Cities, which would be a credit to the largest cities of the world, and in the tent, awning and canvas goods line, there are but one or two concerns in the entire country that excel in magnitude that of H. G. Neal, who maintains factories in both Minneapolis and St. Paul.

All orders for tents, awnings, canvas covers, etc., whether large or small, receive the most careful and painstaking consideration from Mr. Neal. By virtue of his reputation as being the largest manufacturer and dealer in his line in this section, as well as for his reputation for honorable and upright business methods, customers may feel assured of honorable and just treatment.

He has recently completed the awning work for the great Plymouth Clothing house, and the New England store of Minneapolis, besides he has secured the contract, and has nearly completed the large tent for Minnesota State Fair Association, including seats, etc. This tent will have a seating capacity for fully 5,000 people. He also furnished the tent and outfit for the Operatic Co., which played at Lake Harriet last season, and is going to supply the New Light Opera Co., that is to be located at Nicollet avenue and Thirteenth street, for the present season with a complete equipment of canvas seats, etc.

Mr. Neal makes a specialty of awnings for private dwellings, and architects who will allow him the privilege of making estimates on this kind of work for the better class of residences, or, if they will kindly suggest to their clients to call at Mr. Neal's establishment at St. Paul or Minneapolis, will not only confer a favor to Mr. Neal, but also to the clients, as all that one can do, will be done to insure perfect satisfaction to both architect and client. Mr. Neal takes special pride in referring anyone that is interested, to many of the most handsome dwellings in the Northwest, for which he has furnished the awnings.

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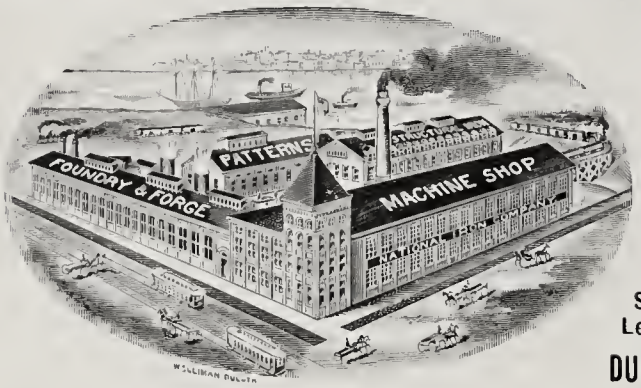

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THE Canadian authorities who are so much exercised over the employment of American civil engineers on Canadian railroads, might get some more advertising of the same kind by making inquiry into the practice of employing American architectural talent.

TORONTO, according to the "Canadian Architect," had felt safe with water pipes buried three and one half feet in the ground until the experiences of the last "exceptional" winter, when the frost in some cases reached pipes buried five feet. The water pressure at the great Toronto fire is said to have been deficient, but it is not charged that the condition of the mains is the cause. In the Twin Cities, it is thought best to insure against breaks from frost by burying water pipes about nine feet, but in Minneapolis the past winter the city authorities were greatly puzzled to account for the unusual consumption of water. The mains crossing the river were accused of leaking, the pumps of "slipping" and what not. The plumbing fraternity, however, accounted for it by the fear on the part of house owners, that their supplies would be cut off by frost unless the water was kept running in them. As water meters are by no means universal, there is ground for such a suspicion.

BARON KANEKO, an L. L. D. of the Harvard Law School, member of the House of Peers of the Japanese Parliament, now visiting this country to study economic conditions and to report to his government certain features of the St. Louis exhibits, is firm in the belief that his people are thoroughly awake—on the war issue at any rate. He explains that his nation is not callow, and that his people are not restricted to imitation, that they are using guns of their own invention and that Dr. Shimose's smokeless powder which they use for bursting charges in shells, is "five times more potent than . . . the redoubtable lyddite." Something very like confirmation of this claim comes from some of our naval officers who saw its effects on one of the Russian ships captured at Chemulpo.

BILL boards seem likely to prevail until public sentiment is worked up to the point where they are looked upon as much more of an offense than now. This department has had occasion to comment on at least one instance where the courts had assumed a jurisdiction quite unusual, and had sustained an ordinance requiring acquiescence on the part of the neighbors before bill boards could be put up on private property. So far as we know, the legality of this ordinance was never tested in the highest courts, because the bill posters interested, found no difficulty in getting neighborhood signatures to petitions for permits to put up their boards. At any rate, it is to be doubted if higher courts would sustain any ordinance prohibiting the erection of bill boards on private property if so substantially done as to remove the idea of a menace to public safety. We are not advised that any attempt to tax these displays has ever been taken up for final decision in the courts, but if such a taxing power were shown to be within the legislative province, the nuisance could be readily brought under control. It is possible that by a stretch of the rulings that have put a stop to the defacing of natural scenery by advertisements, the nuisance in its present phase may yet be reached. Meanwhile the St. Paul Civic League is doing the right thing in trying to arouse public opinion by putting up some model bill boards of a decent and orderly sort, and the Minnesota Art Commission are helping along the good work as they can.

THE metric system is reported to be too much for the Russian military system. It seems that the guns at Vladivostock did not reply to the first attack of the Jap fleet, because the ammunition was too plump by several millimetres.

THE press item given below may indicate nothing more than a flirtation, yet in certain lights it has a serious leap year look, too. Happily it comes a good deal short of an announcement:

SEEKING ALLIANCE WITH HARVARD.

The following announcement was made last week at Boston from the office of Henry S. Pritchett, president of the Massachusetts Institute of Technology: "The following resolution, passed by the corporation of the Massachusetts Institute of Technology, has just been transmitted by the executive committee of the institute to the corporation of Harvard University:—

"Voted, That the executive committee be requested to ascertain whether any arrangement can be made with Harvard University for a combination of effort in technical education such as will substantially preserve the organization, control traditions and the name of the Massachusetts Institute of Technology."

This action of the corporation of the institute was communicated to the alumni and the faculty immediately upon the passage of the resolution.

If the union can be brought about so as to effect a real "combination of effort in technical education" that can be maintained, all will be well, but in the light of experience such a combination will certainly be exceptional. "The Tech" itself, is not wholly free from certain conservative influences which stand in the way of, rather than aid technical education—a leaning toward a supposed culture not always free from scholasticism which may more readily be overdone than the teaching force may be disposed to recognize. The Institute is doing good things, but many of these good things come from outside initiative. Naturally a larger percentage of its students are men with an ambition to do things, than are to be found in the average student body at universites. These ambitions are hindered, rather than helped by the conservatism referred to. How the union of a Technical school with a university can fail to strengthen this conservative tendency, does not appear.

SOUTHERN Yellow Pine is having its merits made known to those interested in its use by means of a valuable booklet issued by the Southern Lumber Manufacturers' Association. The booklet is evidently being used as a circular and in addition to containing rules for grading and the standard sections of boarding, has tables of strength of the principal varieties used, and much other technical information of value. Here will be found the conclusions reached from testing timber from trees that had been boxed for turpentine, in comparison with other timber that had not been so "boxed" or "bled." The relative strength of Cuban, Long Leaf, Loblolly and Short Leaf pines are given, showing that they stand in the order named, and seem to vary about as the average specific weight of the different kinds. Just how any one is to tell which is which by the time the varieties have reached new markets, a thousand miles from their native home, it does not state. A table of average weights per cubic foot, at a certain standard of dryness, might have been some guide to strength if not to variety, taken in connection with the table of strengths of different varieties. This table credits the four varieties with transverse strength relatively at 100, 91, 84 and 77, in the order named, and the relative weight as 100, 94, 82 and 77.

The benefits of seasoning as stated in the booklet, surprise readers who have not had their attention called to the subject. Ordinary yard timber is found to be 50 per cent stronger than green timber and the strength of this yard timber is said to be capable of a 30 per cent increase by kiln drying. Both these statements will appear rash to people familiar with more northern varieties of pine and other woods, and in fact the tables given in the booklet hardly bear out the deductions. Kiln drying, unless done with care, has not only been held to detract from the strength of lumber, but its effect upon the weathering qualities—as of shingles so dried, to save freight in long distance shipments—has been questioned.

A feature of the booklet, little short of a curiosity in these days, is the flitch beam with methods of calculating examples and tables of strength. An example given requires dimensions of iron plate and timbers necessary to form a flitch beam carrying 80,000 pounds with a clear span of 18 feet, and the answer gives a beam 18 inches deep with a plate weighing with bolts, more than 80 pounds per foot. But as a 20-inch I-beam alone, weighing 80 pounds per foot is considerably stronger than the flitch beam, which would require 22½ feet board measure of southern pine per foot in addition to the plate, the resuscitation of the flitch beam will be attended with difficulties. The booklet also fails to point out, or in any way to anticipate the difficulties that arise from the shrinkage that takes place in the timber bolted to the sides of the flitch plate. As manufacturing tables are coming more and more to be used, such oversights are to be deplored.

IT is claimed for union painters that they have secured advances in wages per hour of fifty per cent within the past five years, with generally a reduction of twenty per cent in hours. This would mean a smaller real advance in earnings than cost of living, unless it brought with it less lost time, which is probably the case. It would increase the labor cost to owners more than fifty per cent if the manner of finishing remained the same, but much inside finishing is now done with but a fraction of the labor formerly required. Less wood finish is being used, relatively, than formerly, which would have a further tendency to cut into the employment of painters. Paints and varnishes have not risen in price to any great extent during the period; in fact, there have been at least two times of very low priced linseed oil during the time, so that owners have not felt this increased labor cost so keenly as if materials had gone up as in some other departments of building.

THE Bricklayers of Buffalo are carrying the sympathetic strike pretty well to the limit if press reports do not misrepresent them. The stonemasons being on strike for higher wages, the bricklayers have decided to lay no bricks on concrete foundations. This action has led to something very much like retaliation on the part of contractors who have declared a lockout of all masons, tenders and teamsters affiliated with them. All this indicates that the interests involved are feeling more "cocky" than is, very fortunately, the case in the building trades generally throughout the country. There are several potent reasons why peace will prevail largely in labor circles during the season, the foremost of which is the empty domestic bin to which we have called attention before. Although wages in organized callings have been high for the past two or three years, all indications point to an increased cost of living to more than offset increase in wages during the past year, except in cases where the wage earner was enabled to offset the increased cost of living by less idle time. Such a chance was exceptional, for the last building season was short, with many rainy days, and succeeded by an unusually long winter. It is safe to count on the sentiment of the workman as desirous of employment, and the business agent will have uphill work in overcoming that sentiment, especially as the developments of last year were not such as to better the standing of business agents before either the unions or the public. Indeed, contractors are looking upon the business agent as less and less of a bugaboo, and if he pulls through the present building season without further loss of prestige, he will be in luck.

An issue is, however, awaiting stone masons, not alone in Buffalo, which will need to be met with something more than sympathy if the masons are to hold their own. The struggle between the stone wall and the concrete wall for foundations has scarcely been announced as yet, but a few samples of concrete foundation walls are being widely scattered about the country, taking the seeds of reflection with them. The concrete wall is not a new thing in building—we have listened to accounts of house walls built of concrete a half-century since, and not only of concrete, but bonded at intervals by wires—but the merits of house foundation walls, built of good cement concrete, have just begun to be thought of by the building public. For large work concrete has been displacing stone for years, a condition less serious for the trade of the stone mason than will come from competition in the materials of house walls. Stone masons will have to meet this competition badly handicapped by the record of their works, for every building superintendent knows that if he expects to get good stone walls for foundations from the average of masons, he has to almost open a trade school on every foundation job. Good materials placed in the hands of the mason are no guaranty for good walls. Beginning with the footings, if good flat stone are furnished, as commonly laid, a stone footing four feet wide will be no more efficient for support than the concrete footing of three feet. When it comes to walls, if outer walls, where earth is to be filled in against them, all stone will be laid with reference to show from the inside, so that while a fine appearance will be secured here, the side toward the earth bank will be loosely and roughly built with probably twice the joints that the inside has. One of the hardest problems for the superintendent, is securing anything like a uniform distribution of headers and stretchers in such walls. As usually built with lime mortars, the outer side of these walls is not only unfit to carry weight, but it offers hardly any barrier to the entrance of water into the wall. If the soil happens to be clay, it is next to impossible to so fill back against the wall that water will not follow down between the stone wall and clay bank for years after, and on occasions of heavy driving rains, soaking through the lime mortar joints everywhere.

Sufferers from this kind of work are in good shape to be converted by the new concrete propaganda. To excavate in these clay soils to just the size required, to use the clay bank for the outer side of a mould for concrete, to build a concrete wall of far better materials than the old mortars, to secure a wall with considerable less materials than before—a wall that is a monolith—all this looks to be very desirable, if not too costly. As to cost, good cements can be had cheaply enough. Sand will cost about so much in any case, and often the gravel pit will do the rest, but if there be no gravel pit available, stone crushers are much in evidence in parts. For light buildings, concrete walls of twenty or twenty-five per cent less cubic feet than stone walls may be used with equal safety, a factor that gives the concrete a good start at the outset in the matter of cost. The wage item also is apt to favor concrete.

SINCE Mr. Dooley's friends found the germ in Germany, the parasite in Paris, and the microbe in Ireland, everybody has been at a loss to know how anybody could have pulled through before the discovery. Here, at last, is an explanation by Life.

When the May baby and the June baby became well acquainted they exchanged confidences.

"My milk comes from a certified cow," said the May baby.

"So does mine," said the June baby.

"It is milked by a man in a white suit, with sterilized hands, through absorbent cotton, and kept at a temperature of 45 degrees."

"So is mine."

"It is brought to me in a prophylactic wagon drawn by a modified horse."

"So is mine."

"Then how in thunder do you manage to be so fat and well?"

The June baby winked slyly.

"I chew old paper, and the corners of the rugs, and anything I can find that is dirty, and in that way I manage to maintain the bacterial balance so essential to health," he said, chuckling.

The May baby laughed long and loud.

"So do I," said he.

MAIN ENTRANCE TO FRANK T. HEFFELFINGER'S RESIDENCE, MINNEAPOLIS, MINN.
Wm. Channing Whitney, Architect, Minneapolis

NORTH ENTRANCE TO FRANK T. HEFFELFINGER'S RESIDENCE, MINNEAPOLIS, MINN.
Wm. Channing Whitney, Architect, Minneapolis

THE CHAS. M. HARRINGTON RESIDENCE.

By E. B. Northrop.

The twentieth century business man, whose affairs are conducted upon large and strenuous lines, becomes so engrossed in the work of money getting that it is fair to absolve him from any genuine devotion to the purely ideal or artistic in life. He is supposed to be able to buy whatever of convenience is necessary to his physical and mental comfort, even though he should affect the highest sentiments of culture, refinement and asthetic repose. It is rarely, therefore, that the eminently successful American man of affairs develops his own and family's characteristics along artistic lines above the merely conventional. Occasionally, however, there looms up in the field of the ordinary and practical some example of lavish monied expenditure which at once assures an intelligent observer that culture and refinement have combined with wealth in its production.

Such an example is to be found in Mr. Charles M. Harrington's new home at the corner of Park avenue and Twenty-sixth street, Minneapolis, several illustrations of which appear in this issue of The Western Architect.

Situated upon a commanding terrace of ample space the quiet, dignified elegance of the exterior of this mansion of the Italian renaisence at once attracts special attention and vouches for something better than mere modern tawdriness within. The utilitarian and the artistic are at once combined in the plain walls of light colored brick which add delightful coloring to surfaces devoid of the many incongruous shapes and shades too often affected in other styles and other materials of costly homes. The exterior, indeed, is a noteworthy example of architectural perfection in perspective, coloring, form, style and simplicity characteristic only of what is highest and best in art.

Pleased with the exterior, the visitor who enters this home of Mr. and Mrs. Harrington naturally expects to be ushered into a reception hall of large and dignified proportions, rich, subdued and unostentatious in its decorations and colorings. Here at once is indicated a culture and refinement which is even more than high art architectural construction and established individual characteristics which must have dominated the prevailing idea and plan. Not a single glaring effect in wood-work, walls, glass, decorations, lights, colorings or furnishings has been permitted to detract from an unusually sumptuous yet quiet effect. The grand stairway rises from directly opposite the main entrance to the hall and it has therefore been possible to make it a prominent art feature of the splendid apartment. In addition to the large reception facilities of the hall upon the main floor, the second-floor landing room may be considered a desirable and unique addition thereto because of its extent and its finishing and equipments.

To convey anything like an adequate idea of the character and convenience of this model and modern home—which equals the most pretentious in any of our American cities and surpasses the general average of the finest residences in cities like Cleveland, Detroit, Buffalo, Milwaukee and others of that class—would require a minute and technical description of every apartment; for each room possesses its own individuality and special adaptation to its purposes. To do that would require a volume, and therefore this description is necessarily limited to generalities.

The parlors, library, dining and tea rooms, living rooms, Mr. Harrington's personal "den," and the kitchens, pantries, etc., are all upon the first floor, but so arranged that all which pertains to the work of the household is perfectly isolated. In a general way there is a sustained plan of exceedingly elaborate and costly wood-work, wall decorations and furnishings, but there is a total absence of anything like hysterical bric-a-brac or excessive garnishment. While there has been a decided conformity in order to create a general harmony of effect, yet each room has a personality so distinct that its special uses are at once apparent. This is somewhat illustrated by the evident fact that every article of furniture has been made from special designs appropriate to its uses and its environment; and in the living rooms and individual apartments it is also evident that personal tastes have suggested the style and art of the belongings. It is perhaps permissable to state that in this particular few homes in any country can give better evidence of artistic perception and knowledge than is displayed by the quality and perfection of the various accessories to convenience and comfort that are here observable.

Again, there is evidence of not only careful study, but of special tact on the part (we presume) of Mrs. Harrington in the the central hall and adjoining apartment arrangements which affords unusually commodious and continuous room space for guests upon the occasions of large social functions; the floor plans in this regard could not possibly be improved upon.

In so complete a structure it was, of course, to be expected that there would be no exterior or room evidences of heating appliances; everything being confined within the walls—therefore more effective both as regards heating and ventilation.

The basement may be said to be devoted by Mr. Harrington to more masculine pleasures; for there is the superb billiard room and card rooms and accessories that are supposed to delight and entertain when not brought into competition with the drawing room or the ball room.

The second floor is a marvel of luxuriousness, and there are the private apartments of the family. A unique feature is in the fact that every apartment connects with one adjoining, and the entire circuit of the great house may thereby be made without entering a hall passageway, as may been seen by study of the floor plans as they appear in this connection. Here, as all the furniture and fittings have been made from special and original designs, is again evinced individual characteristics; and exquisite and cultivated taste is everywheres exhibited. All of the apartments are very large and, of course, supplied with every convenience and luxury known to these luxurious times. Miss Harrington's wardrobe apartment with its

RESIDENCE OF MR. JACOB DITTENHOEFER, SUMMIT AVENUE, ST. PAUL, MINN.
Cass Gilbert, Architect, New York and St. Paul.

THOMSON BLOCK, WINNIPEG, MAN.
Sproat, Rolph & Chrysler, Architects, Winnipeg

Photo by
Edmund A. Brush

CARRIAGE ENTRANCE—CHARLES M. HARRINGTON'S RESIDENCE, MINNEAPOLIS, MINN.
Kees & Colburn, Architects, Minneapolis

C F. Haglin, Contractor

Photo by Western Architect Staff

RESIDENCE OF CHARLES M. HARRINGTON, MINNEAPOLIS, MINN.
Kees & Colburn, Architects, Minneapolis

C. F. Haglin, Contractor

HALL IN CHARLES M. HARRINGTON'S RESIDENCE, MINNEAPOLIS, MINN.
Kees & Colburn, Architects, Minneapolis

Photo by Western Architect Staff

PARK AVENUE, OR FRONT VIEW OF FRANK T. HEFFELFINGER'S RESIDENCE, MINNEAPOLIS, MINN.

Wm. Channing Whitney, Architect, Minneapolis

C. F. Haglin, Contractor

Supplement to
The Western Architect.

June, 1904

Roofed with Celadon Roofing Tile

NORTH VIEW—FRANK T. HEFFELFINGER'S RESIDENCE, MINNEAPOLIS, MINN.
Wm. Channing Whitney, Architect, Minneapolis

C. F. Haglin, Contractor
Photo by Edmund A. Brush

Supplement to
The Western Architect

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HALL–SECOND STORY LANDING–CHARLES M. HARRINGTON'S RESIDENCE, MINNEAPOLIS, MINN.
Kees & Colburn, Architects, Minneapolis

Photo by Edmund A. Brush

ENTRANCE TO CHARLES M. HARRINGTON'S RESIDENCE, MINNEAPOLIS, MINN.
Kees & Colburn, Architects, Minneapolis

C F Haglin, Contractor

DRAWING ROOM IN CHARLES M. HARRINGTON'S RESIDENCE, MINNEAPOLIS, MINN.

Kees & Colburn, Architects, Minneapolis

INTERIOR OF C. M. HARRINGTON'S STABLE, MINNEAPOLIS, MINN.
Kees & Colburn, Architects, Minneapolis
Equipped with the American Sanitary Stall System

COACH ROOM IN STABLE OF C. M. HARRINGTON, MINNEAPOLIS, MINN.
Kees & Colburn, Architects, Minneapolis
Stable Provided with the American Sanitary Stall System

cabinets for hats, laces, dresses, and general feminine belongings, must certainly be the admiration of her girl friends who are permitted to examine it.

The third or top floor of the mansion is given up entirely to the ball room, its stage and the adjoining retiring rooms. The ball room is fifty feet square and in some important features is probably unsurpassed by that in any private home in the country. Here, again, rare appreciation of the fitness of things is observable; for the simplicity of the decorations and colorings have been adapted to the important end that they shall not detract from nor make too conspicuous any gown effects that may appear upon the ball room floors. The walls are in soft gray with decorations that are mere suggestions of splashes of old rose and the finishings are in a light cream color. The upholstering of the seats corresponds with the wall colorings, and the total result is reposeful enough in itself to afford a degree of rest to the dancers. A comfortable feature of the seating arrangements consists of a half-step extending the entire length of the seats and forming a foot-rest which protects the draperies of those who are seated from contact with the dancers. The ball room is really an auditorium suitable to large dramatic or musical functions as well as dancing; and in size, decorations, stage and side-room accessories, it is one of the most notable private auditoriums in the country.

As a whole, Mr. Harrington's mansion is a composite art work upon which the careful thought and intelligence of himself and family has been concentrated for the purpose of creating an ideal home, directed and assisted by the technical skill, artistic temperament and thorough architectural and constructive knowledge of Messrs. Kees & Colburn, of Minneapolis, and the personal attention of Mr. John S. Bradstreet, whose name is everywhere recognized among the first in the profession of decorative art.

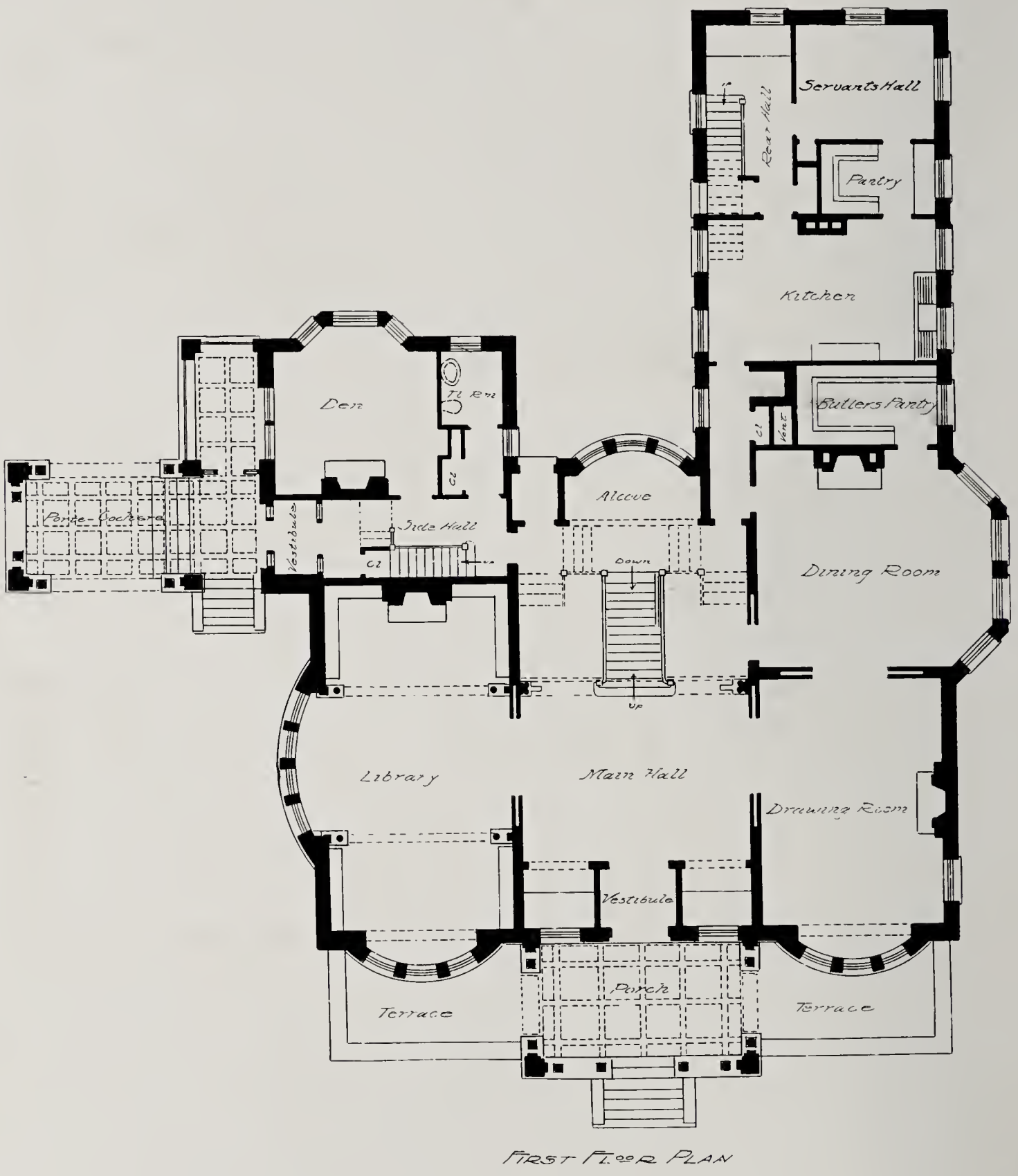
It is impossible, in the limits of this article, to detail even the most important constructive features; but the heating and ventilation of the building constitutes a matter of public importance. The boilers and all the machinery connected with the heating and ventilation are located in the basement of the stables, from which a tunnel-way for all piping connects with the residence. The system is of such perfection that any desired temperature may be produced and maintained in any part of the mansion wholly by wall radiation; and there is not a square inch of floor space but is constantly having its air changed and purified. Air pollution is simply impossible in any part of the building. An object lesson has been provided which every architect should at least familiarize himself with.

Mention should also be made of several innovations in the kitchens and pantries which add greatly to their conveniences, but they can only be appreciated by being seen.

It is quite a matter of course that the bath rooms and lavatories should be fitted and constructed in the most perfect manner known to convenience, attractiveness and sanitation. They are the perfection of modern appliances and materials.

THE STABLES

Relatively considered, the average man and trained architect and specialist would probably consider Mr. Harrington's stables even a more complete utilitarian and scientific triumph than is the residence. It is undoubtedly the most perfect building for its purposes that has yet been constructed either in this country or in Europe; for is possesses features of sanitation that as yet are not in general use and a number of special features which are unique and unsurpassed. Coupled with the use of materials that are the best attainable this palatial stable, although not yet finished in complete detail, is attracting the attenion of owners of valuable horses, and of architects and builders from all over the country. So perfect is the heating, ventilating and flushing, which is that of the recently perfected American Sanitary Stall system, that not a trace of antimonial odors are possible anywhere in the building, not even in the stalls. Indeed, there are comparatively few residences in which the problems in sanitation have been so perfectly solved. The floor air is constantly renewed under pressure so that there is no opportunity for fouling or contamination, and stall drainage is immediate and complete. The flushing system is as perfect as enclosed conduits and pipes can make it, and may be continuous or periodical at will. Perhaps the reader will best appreciate the extraordinary care that has been taken to maintain cleanliness and sanitary conditions by knowledge of the fact that the feeding of hay—ordinarily attended by so much deliterious dust—is accomplished without a particle of dust accompanying or remaining with the material used, be it timothy for food or straw for bedding; the result of air blast cleansing before the material goes into the stall. Equal facilities for keeping dust and dirt out of every apartment of the stable are noticeable. The ceiling of the carriage room is in process of finishing and will be appropriately frescoed. There is room for six vehicles each side of the runway, which is covered with heavy matting. The carriage floors each side of the run-way affords opportunity for pleasing decoration, which is utilized by the foreman in charge by a light covering of snow-white sand upon which he has stenciled conventional designs in brilliant colors. For the week of the Fourth of July the designs will consist of "Old Glory" and other evidences of patriotic citizenship. Architecturally the stable, of course, compares with the mansion, and its living conveniences for the stable men in the second story are in keeping with every other detail of expenditure about the place. By the use of the basement of the stable for the heating and ventilating appliances, the fuel bins, etc., the house is free from any possible annoyance of noise or dirt, and affords so much more room in the basement in the main building. The harness, dressing, bath, working and tool rooms of the stable are each large and equipped with every facility for their purpose. There has been no effort at profuse ornamentation and there has been no limit to expenditure which was necessary to provide the best materials known to constructive work that might in any way add to the features which make this modern home for the horse perfect.



FIRST FLOOR PLAN OF C M. HARRINGTON'S RESIDENCE, MINNEAPOLIS, MINN.

Kees & Colburn, Architects, Minneapolis

SECOND FLOOR PLAN OF C. M. HARRINGTON'S RESIDENCE, MINNEAPOLIS, MINN.
Kees & Colburn, Architects, Minneapolis

*A MANUFACTURER'S TALK TO ARCHITECTS

By M. D. Gates,
Of the American Terra-Cotta and Ceramic Company.

I have always noted in regard to architects and builders, that the feeling seemed to be prevalent that they can meet only in architects' offices, and that outside of these offices they must absolutely decline to know each other. The extent of that feeling has been surprising to me.

It seems to me that a man who is in your profession, planning one building after another—a home, a sky-scraper—ought to reach out and encompass in his work all the industries included in the completed building, and that his relations cannot be too close with the men who carry out his plans, with the men who put up the work. He ought to bring to his office all the details of these various manufactures, and, necessarily, he must reach out after the individual ideas of the people who translate into stone, mortar, brick, and wood the conception he has in mind.

I remember at an architectural meeting in Chicago—I was at that time president of the Builders' Club,—one of the things I looked forward to was that the Builders' Club might extend some courtesies to the visiting architects. There was a very strange feeling—that they could not come to the Builders' Club, though many of them did finally accept the invitation. After the meeting I was talking to one of the gentlemen from Philadelphia, and he said if he were to go back and tell them at home of the relation between the Builders' Club and the Architects' Club in Chicago, they would not believe it.

If you draw a plan the contractor is the man who must translate your conception into reality. He must reach out to Pittsburg for the steel, to various quarries for the stone and marble, to a factory for the terra cotta, etc.; and he has to concentrate these—bring the materials together at the proper time and place.

We know in the construction of the first sky-scraper, the work went along merrily until there was a confusion of tongues. We start with a confusion of tongues, and the contractor goes ahead and uses all the spoken languages he can use, and then resorts to sign-language; but he puts up the building.

It is generally difficult to get an architect to do more than inspect our work; but I find the architect after he goes through the factory is able to handle this line in a better manner than when it is shown up in the office alone. If a man goes to see the building, if he has made a mistake in any particular portion of the work, it is a very remote contingency that that will come to him again. This mistake was the one you didn't catch. I get up some favorite construction, and I find our old Scotchman up on the building will show a very good reason why it will not work, and that is in the line of progress.

Our Chicago Club is in very pleasant quarters, and in better condition than it has ever been, and we will be delighted to see you, gentlemen, when down there. We have pleasant club-rooms, running generally in good shape. We have a traveling scholarship, but every man who goes abroad comes back to New York and locates there.

Many years ago I started in the terra cotta business; there was no literature to it—there was no information to be had. The potter was the most secretive individual possible. If a man had a receipt for a glaze, he shut up his factory, and the general idea was the poetic idea—

> Now let the tired horse go round,
> And let the yellow clay be ground.

Now, there has been progress in your line, there has been progress in many lines, but very possibly there has been more progress in clay-working than has attracted your attention. The Association has improved; it has held annual meetings. There was no delegate system. Each man paid his own expenses, and attended if he wished. It has gathered together from all quarters of the United States men thoroughly in earnest in their business, men who talked over in the papers, in the convention matters that have saved untold money and sweat and agony in the mistakes they have avoided. One man would try out a theory for a general benefit. It has engendered a very generous feeling.

I joined the National Brick Manufacturers' Association because there wasn't anything else for me to join. I couldn't trust the clay men. Being in another line and thoroughly in earnest, I found very enjoyable companionship with the brick manufacturers.

From these two organizations has grown up a literature simply wonderful. Out of it grew the first school, which was established in Columbus, Ohio, in the Ohio State University, being in the Engineering Department. I have had two boys finished in that school, and have two more going there this fall, and I have two or three of the graduates at the factory. I find scientific knowledge is most profitable and interesting, applied to glazes, to pottery, to sanitary ware, and in all the varied lines—there is no limit to them. Very recently I tried an experiment with an artist in Chicago who paints characteristic lines of pictures. He came up and painted three landscapes in clay colors on clay in clay. The three came from the kiln in remarkably good shape. It is a decided innovation. Bright yellows for sunset, browns, blacks, and dark greens for the trees. It worked out very nicely.

The terra-cotta business is a business of a good deal of detail. It is a business, unfortunately, which generally is located far enough away, so that you don't go to see it, unless you have to in that line of business.

When we receive your plans, they go into what we call our drafting room, where a new set of drawings is made, on which we set out every piece of the work that goes into a building. The building or job is given a number, and that particular number will appear just

*A talk by Mr. M. D. Gates, before the Twin City Architectural Club, in Minneapolis, Friday Evening, May 20th.

on that building, and it will appear on every piece of work that goes into that building; so when you go into a building, you will find a number that is what we call a "job" number. We generally begin at the bottom. It used to be the prevailing idea that we began at the top, and made the first work required last. In fact, we received a letter from one party, saying: "Kindly remember that, owing to the rarified condition of the atmosphere in Sioux City, we begin at the bottom."

As I have said, we make drawings showing every piece of the work, that may be lettered 1401, or whatever is the job number, each number course will be given a letetr, as 1401-A, this will identify it as being a piece that comes in that particular course—that will be the piece that will be repeated throughout that course, then we have A-2, A-3, A-4. Mitred pieces are cut in the cutting department; they are cut, moulded, and welded together, and marked each one for its place. From the drafting-room these drawings go in with the full-sized details. In any case, we draw them over on a shrinkage rule—they shrink in drying, so that we have to use a definite mixture in our clays of which we know the shrinkage, absolutely. We measure off 1 1-16 for every inch, and thus we measure off every inch of the profile you send us. We make it over, and makes it just that much bigger. That goes to the plaster-shop, and the running courses are run with a templet on the marble table. We make them in plaster that way, because the clay is liable to change. Then a box, virtually, is made on the four sides. Then this is tipped over and taken apart, and the middle taken out; the hole left goes to the fitting room. More or less work is made up in what we call originals, and all this ware is made up about an inch in thickness, with bridging to stiffen it in the back. It is pounded with a piece of cloth or a piece of clay until the clay is driven into all the intersections. After the bridging is put in, it goes to the finishers, and is all gone over by hand—that is, the whole surface is gone over. We have to fashion the back to fit the iron or wood; a great deal of it hangs on iron, and the back of it has to be cut out to fit to its place. One very vital thing is that we want to thoroughly take into account our material. There has been a tendency to economize in all these lines. We want to get the best and biggest buildings, naturally, that we can for the money. We jump to the conclusion that clay will necessarily withstand fire, and a lesser quantity may be used. We have all learned a lesson from the Pittsburg fire. I am satisfied we want to quit fighting the cement men, and quit finding fault with each other, and each study his particular material, and make it as good as he can. It is a bad thing to own up deficiencies. I confess we have been studying for weather-resisting qualities, for color, for strength, for shrinkage.

If you were putting up a kiln or fire-box, you would get fire-brick, brick calculated for that particular purpose. If it is a furnace that is going to be heated all the time, you use one kind of brick; if it is to be heated and cooled, you use a different kind. There are fire-clays that stand continuous heat, which fly to pieces if heated and cooled. We have all got to pay attention to our work, with that particular reference, and this fire has called it to our attention. The reports are—we did not have any of our ware in Baltimore—that it stood it, probably, better than any other material. Now, in this cheapening process it often comes to the point, where in the lintel or in the flange of an I-beam—(the idea was too much thinness of material when fastened to iron or other substance, on account of the shaping to fit the iron or other material, as I understood it)—because the material was fireproof, we all jumped to the conclusion that an inch of it would do, whereas when it comes to the test in case of fire, because of warpage that is exerted at this point, with the tendency to leave your I-beam or supporting work exposed, you have got to use a sufficient amount for your protection. Architects generally are coming to that conclusion from fire experience.

After the ware is pressed and finished it goes into the drying-room. There are very many questions that come in there. We have to be very careful with the mixtures, and we hold to our own results.

Terra cotta is a mixture of different raw and different burned clays, whose chemistry, after being once ascertained, must be adhered to very closely. If the mixture is not absolutely right, when your work goes in on the coils it begins to crack. After this it goes to the slipping-room, and is given a thin coat of very fine clay, which forms a sort of skin, giving it a uniform color that would be impossible to get on the body of the old terra cotta and ground brick, making the rough preparation, which forms the bone of the material. As a skeleton holds up the body, so this material holds it up in the drying, and holds it up in the burning. Having covered this with slip or glaze, it is taken to the kiln, which is virtually a great big oven. We cannot put the flame through our ware. We have ovens 16 feet in diameter, with 8, 10 or 12 fire-boxes. From the top down through is a central stack from which radiates many chimneys, in order to heat it all evenly. Fire-tools are placed every two feet. Fire-clay slabs are so placed that a floor is built approximately every two feet through the kiln, each piece has only its own weight to bear. The door is bricked up with fire-brick, and again outside, letting the flame pass between. We burned for a great many years with oil, which is a very fine fuel; but Mr. Rockefeller got to making more donations to the Chicago University, and got oil up where we couldn't reach it, and we had to go back to coal. The burning takes from 80 to 100 hours, and is about the melting point of gold—i. e., 1,100 degrees centigrade. Every part of the kiln must be equally heated. The colors are brought out by the fire. A clay that will burn red may be a slate color in the bed, and burn bright red in the fire, so

that every part of the kiln must have the same heat to obtain, which is a very intricate proposition—that is, to raise the kiln to a high heat and have that result. Formerly the only guide was to look in at the fire. The potter classifies heat into gradations finer than the silk-ribbon colors at a lady's counter.

Considerable of my time has been devoted to making enemies of the people coming in with samples. Every one of them knows he has got a bank; he doesn't realize it is a clay bank, he thinks it is a national bank, at least. For instance, a man brought in a sample, and said it had been fired at a high temperature. I said: "It has been nicely concealed; it doesn't indicate it." Then he said it was burned in a china-kiln, which takes the lowest heat of any.

Clay does not lose its plasticity until it loses a certain amount of water—until it passes the cherry-red point. To test this heat, outside of color, we make try-pieces an inch thick and about four or five inches long, which are laid in try-holes, one row above and one below. After you get above bright-red heat you can see what is in the kiln. After it gets heated up you can reach in a steel rod, and bring it out and study it, judging from the effects on that what stage of the burning has been arrived at.

A good many years ago a man by the name of Saeger invented what is known as Saeger's cones. They are made of different materials, about three inches high, in pyramidal form, and tapering up. These are given definite numbers. They are put in the try-holes so that you can see all three of them. Then a man can burn until he begins to see one of them bending over. By the time that runs over, the second one will begin to bend, etc. He may burn his kiln at different degrees of heat, as he may require; but when a man says he burned the material at Saeger 7, you understand at what temperature it has been burned.

As denoting the change in the general tone of the potter's ideas, I will state in regard to the American Ceramic Society. These fellows had this work, and were perfectly familiar with it, and realizing its value it was apportioned out among them and translated—a great deal of hard work to do. Both volumes are now out in reach of the English-speaking people of the world.

A great building is like a composite photograph, supposed to give some of the characteristics of the whole class or group as boiled down into one. Well, a building is a composite photograph. It has the most of the architect, because his is the brain that conceives the whole proposition; but there is an individuality, from the mortar-mixer up, that goes into the building. I think without individuality and without enthusiasm you never get good work. I believe that every enthusiastic worker is putting a little section of his life into a building, and there is that composite proposition, a little section of the life of every worker just as there is in the composite photograph; but I know, of course, the master mind is the one that has conceived the general outline of the building. It doesn't do for me to think that it is better to put this or that here. I haven't the grasp of the whole situation as you have, but the man who thinks he can alter a piece of detail is going to get the architect into trouble because he does not grasp the whole proposition.

It is a highly dangerous thing to run a man in with a hobby to speak to a young and growing organization. The only good definition I ever heard of the word "hobby" was, naturally, given by a crazy man. A man going through one of our Eastern institutions, saw a man sitting astride and apparently driving. He stopped and said to the man, to humor him: "That is a fine horse you have." The man looked at him with scorn and said: "It isn't a horse; it's a hobby." The visitor asked: "What is the difference?" He replied: "Anybody ought to know that; you can get off from a horse."

I know my weakness, and I appreciate the chance to talk my material. When my friend Hewson telephoned me day before yesterday, I was celebrating one of the sickest bilious headaches it has been my lot to have; but when he informed me what he wanted, I got right down close to the instrument and yelled: "Yes, yes; I'll come;" and I am mighty glad to be here with you. You are the men I would like to meet. Generally we have to go into an architect's office on all fours with great humility, and seldom get back to where you gentlemen are.

I am not going to say that you have built two great cities; but that you are going to build a great many good buildings; that the men right here—and I am surprised so many came out to hear me—are going to achieve things in the building line. I think we builders are getting educated; we believe more in our business. You are going to try to build bigger buildings, finer buildings; and we want to be able to do our share, creditably alike to ourselves and to you, who can do great things.

There are many differences to be observed in methods of construction employed in the Northwest, as compared with those in the East, says the Canadian Architect. The severity of the climate in winter makes it necessary to give the occupants of buildings greater protection against the cold. Hollow walls and box construction for windows are prominent features. Houses are built as far as possible without projecting features, chimneys being kept inside the walls in order that as much heat as possible may be retained within the building. It has been found that a thin hollow wall is of greater service as a protection against cold than a solid wall however thick. As during the period of frost there is little or no rain, no coping is required for brick walls and chimneys, and the exterior of buildings is not subject to disintegration by alternate thawing and freezing, as in a milder climate.

THE "PURE-AIR" PROBLEM.

By E. B. Northrop.

Eminent physicians throughout the world are now advocating, more strenuously than ever before, the "pure air" treatment for the prevention, amelioration and cure of all diseases incident to mankind. Open air sanitariums for those afflicted with tuberculosis are rapidly becoming recognized as a first necessity. Scientists who are devoting their very lives to the discovery of disease bacteria and how most effectually to prevent their ravages upon animal life, are also determining beyond question that polluted air is the potent incubator in which the most dangerous bacilli develop and thrive. Also, that pure air is Nature's antiseptic for the destruction of disease germs or the preventative of their development and distribution.

There has never been a time in the progress of the science of *materia medica* when so much importance has been attributed to pure air as an essential to human well-being, as now.

Without doubt a vast majority of the people of the United States pass at least two-thirds of their lives in a polluted atmosphere—in the school rooms, in the churches, in the factories, in the shops, in the stores, in the office buildings, and in the homes. This is something which the physician can deplore and warn against, but cannot prevent.

It is the architect, and the architect alone, who can solve the question of pure air supply to the occupants of buildings, be they the living, or working places of the people.

It follows, then, that the science of architecture will be looked upon by the science of medicine to determine how best to provide Nature's antidote to bacterian evils which are daily jeapordizing human life. A responsibility is therefore placed upon the architect which modern civilization will recognize and appreciate in proportion to the benefits which became apparent.

In this connection The Western Architect wishes to emphasize the fact that efficient ventilation of rooms, no matter what their size may be, cannot be accomplished by any system which does not take the air from the very floors of the apartment. Merely a vent for the air which rises to the ceiling is of but little aid in purifying the inclosed air. The fact that polluted air is much heavier than pure air, causes the bacteria (or any pollution) to remain upon or within a short distance of the floors; and it therefore constantly occurs, that while there seems to be a regular renewal of fresh air in a room through upper side-wall or ceiling ventilation, yet actual increase of polluted air is going on all the while in the vicinity of the floors. Unless there is some way—like an open fireplace—of actual withdrawal of what may be termed the "floor air," then air pollution in an apartment will constantly increase, even if it is not occupied. This truth compels The Western Architect to deplore the present discussion concerning the best way to cleanse the floors of school rooms and public auditoriums, as there seems to have been created a theory that this or that method is sufficient to rid a school room of whatever dangerus bacteria may there exist. While the fact remains, that constant renewal of floor air is quite as essential as the proper cleansing of the actual floors.

It is obvious that some one of the present effective systems of ventilation which will draw off the foul air from the floor of rooms that architects must adopt, if they give heed to the facts which medical science has demonstrated, and if they would take their rightful position among the promoters of the welfare of humanity. No part of the proper sanitation of a modern building is of greater importance than that of the means and methods whereby pure air is constantly supplied to every inclosed portion of either residences or public buildings. In these days of steam and hot-water heating, as against the older method of hot-air furnaces the necessity for effectual ventilation is becoming more and more important.

The most important work to which the present-day architect can devote his intelligence and authority, is the compelling of the use of such system of ventilation as shall insure an absolutely pure air supply to the interior of every edifice which he is called upon to construct.

Lucknow has the reputation of being the home of the Mohammedan aristocracy in India, and a large number of its wealthiest and most influential citizens belong to that faith. Their cathedral mosque is one of the finest in the country, and the imambra connected with it is a unique structure, and contains the largest room in the world without columns, being 162 feet long by 54 feet wide and 53 feet high. It was built in 1784, the year of the great famine, in order to give labor and wages to a hungry people, and is one solid mass of concrete of simple form and still simpler construction. The architect first made a mould or centering of timber, bricks and earth, which was covered with several layers of rubble and coarse concrete several feet in thickness. After it had been allowed a year or two to set and dry, the mould or centering was removed, and this immense structure, whose exterior dimensions are 263 by 145 feet, stood as solid as a rock, a single piece of cement concrete literally cast in a mould, and, although it has been standing 125 years, it shows no signs of decay or deterioration. The word imambra signifies "the patriarch's palace." The big room is used for the celebration of the Moslem feast of Mohurram, which commemorates the martyrdom of the sons of Ali, the immediate descendants of Mahomet.—William E. Curtis in Record-Herald.

One day the great architect Richardson was approached by a man who had only $1,500 to spend on a house. The difficulties of the problem appealed to Richardson so strongly that he took hold with a zest. It put him on his mettle to produce an artistic result from purely structural conditions. But when the client announced that he could afford $3,000 he was dismissed with a wave of the hand. The great man's interest was gone.—Country Life in America.

CORROSION OF ARCHITECTURAL STEEL.

Although the report of the Insurance Experiment Station in Boston on its recent tests of steel corrosion, under conditions approximating those of steel columns in modern buildings, confirms the results of previous tests of this character, the subject is of such supreme importance that we give herewith, says the Scientific American, a brief digest of the facts. Of course, the value of such experiments depends upon the correctness of the assumption that a severe trial of a short duration gives us the data from which we can argue as to the results of a less severe test, extending over a far greater period. Each specimen of steel was cleaned and encased in Portland cement concrete of varying composition. After the concrete had set for 24 hours in air and seven days in water, the specimens were exposed to as severe tests as could be devised, and after various lengths of time the cement casings were broken and the steel specimens were claned, weighed and measured. The conclusion is reached that if structural steel is encased in a sound covering of good concrete it is proof against corrosion for a period of years which is so long as to make the subject of more interest to our great-grandchildren's children than to us. In other words, steel, properly covered with concrete, may be expected to last until charnges in the laying out of the city, or in the substitution of yet more modern construction necessitates the removal of the building. Obviously, the life of the costly office buildings, hotels and warehouses that are being erected in such profusion, depends not so much upon the work of the steel-maker, as upon the particular "boss" who has to watch the mixing of the cement and its application to the skeleton steelwork.

FIRE-PROOF BUILDINGS.

There has never been any sort of edifice or structure built by man that could not, under certain conditions, be destroyed by fire or heat. In the historic fire in Chicago it was noted that pig-iron piled upon a wharf several hundred feet distant from any building or ignitable material, was melted as though it had been run through a blast furnace. And that was just what had really happened to it; for the iron was melted because super-heated air was forced upon it through tweers or blow-pipes created in the surrounding atmosphere. In all conflagrations which assume large proportions the surrounding atmosphere becomes heated to a degree which, with the wind created, easily and invariably produces some degree of this "tweer" or blow-pipe action; and when that condition arrives no art or appliance of man can prevent the destruction of any structure upon which the blast happens to be directed.

The fact that in every great conflagration certain buildings will remain standing while others, possibly adjoining and apparently more substantial, are quickly destroyed, is simply because the "tweer" blast has missed the structure which has withstood the fire. Even wooden structures remained comparatively uninjured in the great fire at Ottawa, while so-called fire-proof buildings in the immediate vicinity were absolutely consumed. The same phenomena was observed in the two great fires which devastated Chicago, and also to a lesser extent at Baltimore.

The only absolutely fire-proof condition of any city lies in the subjugation of conflagrations before the atmosphere has become heated to the point where 'tweer" action is created.

LIFE IN AMERICAN WORKSHOPS.

Mr. Hans Renold gave an instructive lecture recently in the New Islington Hall, Manchester, England, upon "Life in American Workshops," from the point of view of an English engineer, says the Architects and Builders' Journal. To understand the question aright, said the lecturer, one had always to bear in mind that America was 33 times larger than Great Britain, with double its population. Dealing more particularly with New England, he declared that it was impossible for a visitor to be a week in the neighborhood of Virginia without feeling the different atmosphere. Electric sparks seemed to fly about and give the feeling that no task could be too heavy. Everybody seemed to be hopeful, not to say sanguine. With that frame of mind, surrounded by vast natural resources, was it surprising, he asked, that one found so many enterprising people? Speaking in regard to the workshops of America, these, he said, were owned and managed by a more active, better-informed and better-educated set of men than was the case here in England. To prove this he instanced a workshop in Philadelphia where 30 out of 60 men employed in the office were technical high-school graduates. In the matter of technical instruction, he declared that England was 50 years behind. True it was, he said, that in building its new school of technology, Manchester had attempted to grapple with some of our shortcomings, but unless a broadly conceived, non-sectarian secondary system of instruction was established all through the land, the people of his country could never hope for an adequate return for the money spent on their technical schools. Regarding the work produced in America, he said shop-workers were better fed and less given to drink than Englishmen, consequently they were more steady workers. They were less hampered by trades-unionism, and while not condemning the unions, he thought English workmen would be better fitted if their leaders had a wider understanding of economical laws and industrial problems. They wanted to arouse in the mechanics a desire to do better than they had ever done before—to be more wide-awake and to become more cheerful and happy.

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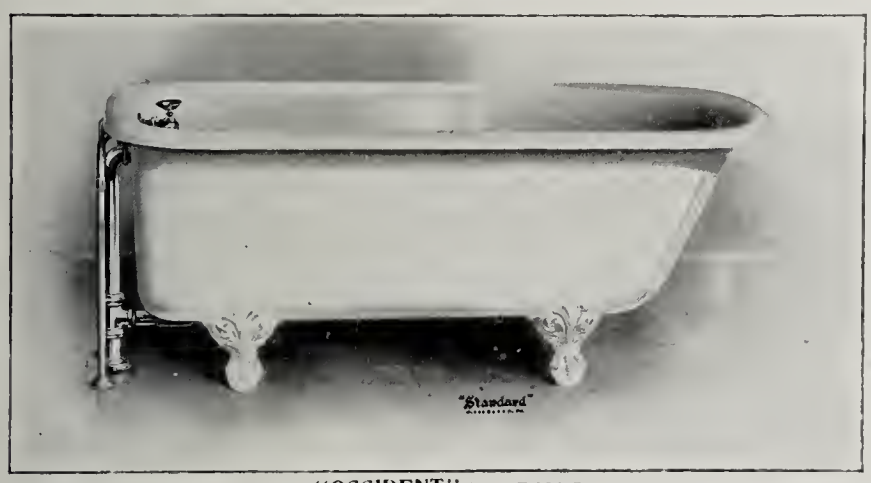

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Some idea of the delicate composition of the Butcher Floor Polish may be gained from the fact that the Pennsylvania Railroad Company are now using this polish largely in their shops at Altoona, Pa., for polishing up and revivifying the finish of the interior woodwork of their finest passenger coaches. Of course the special mission of the Butcher polish is to improve the appearance of parquetry and hardwood floors of all kinds, and it does this better than any similar preparation on the market.

THE ZENITH CITY.

At the head of Lake Superior, the most westerly point on the great chain of inland lakes, which reaches from the northern part of New York state to northeastern Minnesota, lies the great lake port, the city of Duluth, Minn.

The population has grown from 3,483 in 1880, to 75,000 in 1904. It has, perhaps, the best harbor of any city in the world and the number of vessels which arrived and cleared in 1903 was 8,646, with a total tonnage of 9,002,530 tons, valued at about $87,482,976.

The assessed valuation of real estate for last year was around $30,000,000. It has nine railroads which make their terminals there, and commands a large and increasing trade from all the northern and western states of the Union,—the facilities for shipping both by water and rail being almost unequaled by any other city in America.

There are many concerns in the building trades line in Duluth which not only have an immense local business but also enjoy a large and increasing business throughout Minnesota, North and South Dakota, Montana, Wisconsin, Iowa and Nebraska, as well as in Manitoba.

In the architectural iron business, there is the National Iron Works, which manufacture all kinds of columns, beams, channels and general architectural work for buildings. Their foundry and works are located at the corner of Fifty-fifth avenue West, and Ramsey street, and cover a very large area of territory. They are always willing and ready to figure on all contracts, whether large or small, and should be seen and consulted before contracts for work in their lines are closed.

In galvanized iron and copper cornice work, no house in the Northwest is better or more favorably known than that of Deetz & Co., at 404-6 East Superior street. Established several years ago, they have by persistent effort, with good business management and the very best of facilities, built up an enviable reputation as a first-class house in this line. Besides manufacturing galvanized iron and copper cornices, they also make ornamental zinc work, fire-proof doors and shutters, galvanized iron sky-lights, ventilating pipes, smoke stacks, etc., while they also do all kinds of roofing, including tin, iron, slate, pitch, gravel and asphalt. Architects, contractors and owners cannot go amiss if they will only consult this obliging firm when desiring anything of this kind, as it is a pleasure for Deetz & Co. to submit estimates upon all work of the above nature, when they are invited to do so.

While Minneapolis is supposed to lead in the manufacture of lumber and all kinds of mill work for interior purposes, the city of Duluth has some concerns of such great magnitude that they would be a credit to any city in the world. The Scott Graff Lumber Co., which is well known all over the Northwest, are the peers of any similar concern in this country. They manufacture and sell, either by the load or car lot, all kinds of lumber, sash, doors and mouldings, besides doing an extensive business in office fixtures and stair work. Estimates are always cheerfully furnished, especially upon architects' drawings and specifications.

Mr. Louis R. Helbing, located at 322 East Superior street, Duluth, Minn., though not the only one engaged in roofing and cornice work in the Zenith City, is, nevertheless, one of the oldest in his line, having been established for many years, not only in the roofing business, but also in all kinds of tin and sheet metal work. He invites architects, owners and contractors to correspond with, or to call and see him for estimates on all work of this nature. He guarantees the utmost satisfaction in each and every case. His long established reputation is a sufficient guarantee in itself to safeguard all who entrust work to his care.

Another concern which has won prominence among Duluth's enterprising business houses, is that of Burrell & Harmon, sheet metal workers, and makers of galvanized iron and copper cornices, skylights, fireproof doors and shutters, sheet steel ceilings, roofing in tin, iron, slate, pitch and gravel. This reliable and energetic house is located at No. 3 South First avenue, East, where they carry in stock a full and complete line of warm air and combination furnaces. Messrs. Burrell & Harmon make a specialty of the subject of heating and ventilating,—the most important of all things in connection with the comfort and health of the occupants of all buildings. They also handle Electric Heat Regulators, which automatically control the temperature of the rooms of dwellings, and add not only much to the personal comfort of humanity, but save much time and annoyance in attending to the heater. A firm so well known as Burrell & Harmon needs no special comment from us in order to call the attention of citizens of the Zenith City to their business, but as they are equipped to take contracts in their line of work in any part of the Northwest, this may be the means of calling the attention of some outside readers of THE WESTERN ARCHITECT (who have never before been informed regarding their location), and we can assure you in advance that any request for advice, specifications, estimates, etc., will be complied with cheerfully and promptly, and any work entrusted to their care will be given their earnest consideration, and the result of same is sure of meeting with our readers' honest approbation.

FAMILIAR TO ARCHITECTS AND BUILDERS.

We have lately received from the American Sheet and Tin Plate Co., a handsome show card, which they are mailing to architects and contractors, illustrating the trade-marks and mill brands of their various products, including their "(MF)", "Apollo v Best Bloom" and "U. S. N. M. Roofing Tin," which they have lately been advertising in the WESTERN ARCHITECT, and through which, many of the architects of the west have become familiar with this excellent line of goods. A good product conspicuously advertised in first-class architectural journals, does much towards building up an extended business, and such products as emanate from the American Sheet and Tin Plate Mills, have rapidly gained the reputation of being all that the architect or owner desired as durable roofing materials, such as will stand the test of wear in any climate. When using material for roofs, or any other sheet metal work, architects and roofing men should be sure and see that each box and sheet of material bears some well-known and reliable trade-mark like the above, then they may rest assured that they are providing their buildings with as good material as is manufactured.

A MODERN CLOTHES DRYER SYSTEM.

To those interested in the construction and furnishing of the modern building, we would call attention to the Canton Clothes Dryer & Mfg. Co.'s product, whose ad appears on page eleven.

Their line includes anything from a five-rack dryer for residences, to a twenty-rack insulated for institutes, heated by hot air, hot water, steam or gas. They are just issuing a handsome catalogue illustrated with wash drawings, which is sent to those interested.

They claim a great many good features for their product. It is very economical, as the heat used in drying the clothes boils the water and heats the irons, all being utilized, and requires only five cents worth of fuel for an ordinary washing.

The system used keeps the air, constantly circulating through the dryer, which ventilates the articles in the process of drying.

The dryer consists of a drying cabinet and a laundry stove. The cabinet is manufactured of galvanized iron, with a reinforced wrought iron frame, and is very strong, rigid and durable.

The sides are paneled, which gives it a very handsome appearance. The wire screen, hanging rods and guides are of a non-corrosive galvanized metal, which will not soil or injure the clothes.

The laundry stove is especially constructed to heat the cabinet, boil water for the clothes and heat the irons. It is fitted with a reversible grate adapted to use hard or soft coal or wood.

The heating and ventilating, combined with the system of controlling employed, renders it impossible to overheat or burn the articles in the process of drying, and from experience it has been shown that the clothes are taken from the cabinet as white, clean and pure as if dried by the sun or wind, and as the dryer can be operated at any time under any weather conditions, the many little trials and discouragements incident to wash-day are overcome by its use.

If the stove only is to be used, by opening a damper, the heat may be conducted through the stove and chimney without entering the cabinet.

The materials used in the manufacture are very durable and the design and workmanship is the best. Particular attention to minor details being a special feature.

FIRE-PROOFING AND CONCRETE CONSTRUCTION.

THE INTERNATIONAL SYSTEM.

Few catalogues have come to our table that possess so much of interest as that of the International Fence & Fire-proofing Co., of Columbus, Ohio, showing by working drawings and photographs just what this company is doing for architects who want to meet the present demand for fire-proof buildings.

The company's system is very simple, and when one has read this short catalogue, with its tables and certificates of tests from well-known architects and fire-commissioners, he is not left in doubt as to the value of this construction. The company manufactures a steel wall fabric of stock widths of 4, 5 and 6 feet, which is reinforced by steel cables two or four feet apart. This cable, in standard size, contains seven strands of No. 9 wire which are twisted under hydraulic tension and formed with an eye at each end. They are as stiff and rigid as bars, with much greater carrying power and none of the disadvantages of bars. The hard drawn steel wire in these cables has a yield point nearly three times that of ordinary commercial wire.

Photographs of complete and incomplete office, hotel, school, factory and other buildings, including a ball-park grand-stand, are given, and cannot fail to be of interest to any architect The tests are very instructive and strongly remind us of the value and possibility of concrete construction, especially with such embedded steel cables and fabrics as this company manufactures.

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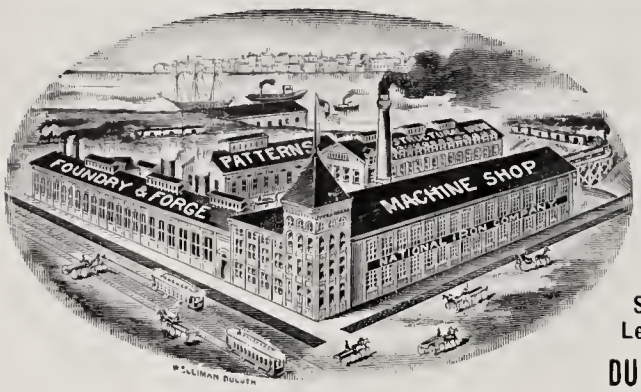

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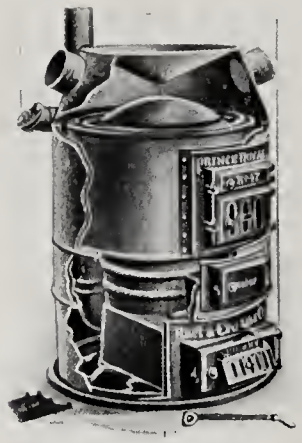

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THAT Colorado labor troubles will fail of far-reaching consequences is hardly conceivable. The assumption by the authorities that men belonging to a workingmen's organization may for that reason be bundled onto trains and run out of the state and dumped, that union men whose families are without means may by the same authority be denied access to the union treasury, that a mine may be closed down because it employs union labor, are assumptions never made before by military authority in this part of the world—or any other—that we recall.

THE proposed merging of the Mass. Institute of Technology with Harvard has stirred up the graduates and former students greatly. At the recent Technology Reunion the most striking feature is described as an enthusiastic determination to see what could be done to assist the Institute to maintain her present independent position. This spirit was so manifest that a number of former students afterward met at the Technology Club and undertook a canvass for funds to place the Institute on an independent footing. To that end a circular has been issued to former students by an executive committee consisting of Dr. Francis H. Williams and Mr. James P. Munroe of the Corporation, and Professors R. H. Richards and Francis W. Chandler of the Faculty.

BUILDERS of the excursion craft plying around New York and the government inspectors who are supposed to keep an eye upon their safety appliances may think it a case of pot calling the kettle black for a representative of ordinary building to pass remarks upon the conditions existing upon the General Slocum at the time of the disaster; but it really taxes the imagination of a person familiar only with kindling wood architecture ashore, to fancy how a ship can be made to burn as did this ill-fated craft, except by design. It is true that most of the building ashore is what one might expect if conflagrations had never been heard of before the buildings were completed and occupied, but this ship appears to landsmen to have been even worse.

Its fate, and the fate of many a structure where people congregate ashore, form a fine commentary upon the civilization that is daily proclaiming itself called for the uplifting of all manner of "inferior" races.

REPORTS of steam railroad building for the first half of the year make rather a poor showing for the country at large, but particularly so in the territory of this big merger of which so much is heard—a condition that has prevailed in this territory for several years. As this same territory has had the benefits of good crops with high prices for them, of heavy immigration and phenomenal advances in land prices during that time, it is possible that some carpers may soon be asking about the benefits to be derived from a private monopoly of transportation interests. The stagnation in this particular part of the country does not come as a reaction from great extending of railways in recent times, nor does this stagnation find a parallel in building conditions generally. Neither can it be charged to the competition by trolley lines, for this section has seen much less of this trolley building than would properly fall to its share. Neither can the entanglement of the Jersey incorporating with the courts be assigned as the cause. The Jersey incorporating was helpful in adding a hundred or two hundred millions of capitalization, but did not materially affect the income of the roads concerned. Nature's bounty and trade conditions took care of the income. Court decisions had no more effect upon the income than upon the real ownership and management of these roads or upon the rates they are charging for service. They don't extend their lines or reduce their rates in response to the growth of the country supporting them because they don't have to—they are not competitors and have no competitors.

Aluminum has failed to take the important place in the arts predicted for it when it came to be produced on a commercial scale a few years ago, and possibly the curious discovery announced some time since, that a piece of aluminum makes a fairly good hone may also explain its want of utility in many situations. Attempts have been made to substitute aluminum for brass of bronze in such situations as mounts for lenses for portable instruments used in surveying, in photographing, etc., but we believe that the best makers now discourage its use, especially where screw threads having considerable wear are involved. The property that would qualify the metal for honing other metals would disqualify it for the friction of threads. At any rate it is noticeable that the common thimble-shaped pressed aluminum covers to collapsible tubes of office paste have a curious way of roughening the softer metal of the tube greatly with but little use.

The concrete fad appears to have been thrust so suddenly upon contractors that many of them are at sea in estimating both labor and materials, with the result that bids for concrete often vary as upon no other portion of the work. Labor cost will, of course, vary much with skill and ways of handling. Apart from this the physical character of the materials used has a good deal to do with the proportions required to secure certain results. Not all contractors or engineers yet recognize the value of having all sizes in both sand and aggregate. Sands, including very fine and very coarse, will require less cement than either fine or coarse; and crushed rock that is not screened in any way will save much sand and cement, as a yard of such crushed rock will weigh considerably more than a yard of screened rock.

One published estimate of materials required in a yard of concrete in place, and supposed to have its origin with government engineers, places the quantities needed for a mixture of 1, 3 and 5 at 1.25 bbl. Portland cement, 0.5 yard sand and 0.9 yard crushed rock. This estimate is probably based on screened rock and coarse sand. We have it from a reliable contractor that on one occasion he put in 35 yards of concrete, following the proportions of 1, 3, and 5 as carefully as possible and used a trifle less than a barrel of cement to the yard. While having no reason to doubt this statement, we are inclined to think the character of his materials uncommonly favorable. Of course, with mechanical mixing and thick walls much coarser aggregate is practicable than with hand mixing and thin walls, and as the finer stuff is displaced by the larger stones cement is saved. There even are cases where quite a percentage of the concrete may be profitably made up of clean cobbles or other stones placed upon a newly rammed layer so openly that the next pouring will easily fill between. This seldom saves in labor but might save cement appreciably. So much do statements vary as as to the proportions of different materials required that we will be glad to give space to publish carefully recorded results.

The publishers of McClure's Magazine have placed students of the industrial situation under obligation by the articles bearing upon different phases of it which have appeared in the columns of that monthly from time to time. Those by Mr. Baker on the labor situation are especially instructive and suggestive. In the current number organizations of employers for the purpose of fighting or treating with workmen's organizations are treated with an insight and broad temperance very rare in writings of the class. There has been so much antagonism with so many tests of strength between the parties and so many outside interests have been touched unfavorably by these contests that it is not so easy to keep from taking sides.

Mr. Baker, at the time of preparing the article succeeded in maintaining an attitude of fairness to both sides, but it was his good fortune to have done with the preparation before late Colorado developments. How he might have written after the exploding of a "mine" under a group of non-union men, and after union men had been shipped out of the state by the military authorities upon no other charge than that they belonged to the union, or after the same military authorities had closed a mine because it employed union men, luckily for the writer and for the discussion we do not know. Mr. Baker leaves us with the impression that workmen's organizations, having had the longer experience, are really better disciplined and more competent as organizations than are their opponents.

The helpful and hopeful things about the article are to be found in the sayings and doings of some of the wise and self-restrained members of both the contending parties. The account of the relations between the Chicago Metal Trades Association and the various unions with which it had to deal should be read by everyone at all interested in such disputes. "The reason for our success" said Mr. Hibbard, the president of the Association, "was that both sides started out with an honest intent—honest, mind you—to live up to the agreement in spirit as well as in letter. I believe firmly that good faith will always bring success in these arrangements. They may talk to my workmen outside of shop hours all they want to, they are at liberty to get them into the union if they can, but they mustn't use my time to talk either unionism, religion or other matters not pertaining to my business." Here are a few statements from union leaders having relations with the Association. "We agree to the 'open shop,' but we are getting the non-union men into our organization. I would rather work six months and get a man by good will than to get him by force. The mere getting a man into the union doesn't mean that he is organized."

"The union should keep the strike as a last trump up its sleeve. I've been a labor leader for eleven years and never called a strike, and never intend to if I can help it."

The article contains so much in contrast with the above as to leave the reader anything but cheerful.

Instances of boycotting and blacklisting are given that fully bear out the crudity, the folly and worse of some of the employing associations. No attempt is made to discuss the economic side of the situation—that would have trespassed too much on the space of the mid-summer number—yet the effect upon the productiveness of an industrial branch of a policy like that in the Chicago metal trades must be obvious to all who have not derived their economic teachings from some of our modern teachers who would have us believe that warfare of some sort is essential to success of any sort—that in order to build you must do some wrecking to obtain materials.

THAT this is not destined to become altogether an age of germicides, of sterilization, is shown by the rise of a new and curious variety of contractors. So much has been written and said of late about the ravages of insect parasites among trees and lesser vegetation, and the great labor and expense thrown upon people of different localities by the poisonous sprays that they are obliged to use in keeping the pests in check, that some bright people have been set thinking and have evolved a theory that has stood a few tests very successfully. As most of these pests are exotic it occurred to some of these people to trace them back to their homes and learn why they were so much less troublesome there. In all cases it was found that they were there kept in check by some parastic enemy which had failed to be exported with them. In several conspicuous instances the introduction of this old enemy into his new home gave the nuisance so much to do that he ceased to give further trouble. While conservatives warn us that the remedy might easily be worse than the disease, it is hardly to be expected that the warning will be heeded in the face of several conspicuous successes already scored. So, now comes the new contractor, with proposals to transplant the proper enemy and set him at work upon the pest; no cure—no pay. The prices asked appear to be such as would leave a good margin of profit, but a success in such cases is worth a high price.

There is in the new method also more promise of success than in the poisonous sprays, which have for some reason failed to go to the bottom of the evil, probably because every here and there a bunch of the nuisances will escape,—just enough to seed down the whole area affected the coming season. A section of New England may be cited where a "fool scientist" is said to have let loose a "specimen" years ago, and any amount of money has been spent in a fight to keep his "gypsey moth" from destroying the elm trees. At present the pest is claimed to have the best of the fight and the people of the afflicted area are looking to the introduction of some enemy to the nuisance for relief. Were some new unchecked pest of this sort to be let loose in our forests, the treatment by sprays would fail altogether, both because of the diffiiculty of reaching the pest by this treatment, and because we have scarcely begun to give scientific care to our forest areas, and consequently could not hope to cope with such an infliction. Such a mishap might easily prove more calamitous to building interests than do forest fires, which are doing so much to raise the pine of the remaining available timber.

SOME tests of cements that have been carried on by the U. S. Ordnance Department at the Watertown Arsenal indicate that the quality of fineness is far more important than commonly believed, and for reasons that have not been at all suspected. Failures in cement constructions that have set up satisfactorily and made favorable showings in early stages, degenerating at later periods, have generally been attributed to some constituent chemically inimical to the product, which slowly succeeded in disrupting the true hydraulic set of the cement. This may be true in some cases, but the Watertown tests show conclusively that the presence of coarse cement in the mass may be injurious. Samples were screened and winnowed so as to take out the coarse particles, and two lots of bricquettes made, one with fine cement and granite dust of the size of this coarse cement and another in which the coarse and fine cements were mixed and handled as nearly like the granite and fine cement as possible. A third lot was made in which only the fine cement was used. Early tests showed nothing of enough importance to record in this connection, but the broken bricquettes being preserved for a period of two years showed a remarkable variation.

Those made of fine cement alone and those of fine cement and granite dust were in good condition, while those made of fine and coarse cement were in a state of complete disintegration.

While these tests do not show that the amount of coarse cement particles present in ordinary cements are absolutely dangerous in concretes, one can hardly escape the conclusion that another reason for insisting on finely ground cements has been added to the old one of their greater sand-carrying power.

BY THE death of George Frederick Watts in his 87th year, England loses, in the estimate of the best critics, the greatest artist she has produced in a century. His works appeal less to the critics whose vision is limited to technique and fashion, many of whom failed altogether to catch the subtler qualities of his work. The imaginative nature of the man could not be confined to painting as his only vehicle of expression, and what was his most famous piece of sculpture, "Physical Energy," a colossal equestrian statue, was proposed to be given a very prominent public place by Lord Salisbury. The honor was declined by Watts, however, for the singular reason that the cost to the public would be too great.

The great group, now cast in bronze, is to be used as a Cecil Rhodes memorial.

IMPRESSIONS FROM THE LOUISIANA PURCHASE EXPOSITION.

By E. P. Overmire.

Among the questions that arise in the mind of the average visitor to the Louisiana Purchase Exposition, assuming that he has seen those at Chicago, Omaha, and Buffalo, are likely to be these: Hasn't this exposition business about reached the limit? Wherein does this one surpass former efforts? Has the most been made of the opportunities presented? Will this one prove successful from a business as well as from the artistic point of view?

Replying to the first question, one feels impelled to say, after seeing this one at St. Louis, that the imagination of man would be strained to the limit to conceive of anything surpassing this as a purely artistic creation. In the items of grand and sustained scale, the massing and handling of units, refinement of detail and general harmony, it grows more and more impressive with study. Mere size alone, of course, will go a great way towards making an impressive composition. When to this is added refinement of proportions and of detail, a close study will but confirm and deepen the sense of satisfaction which the trained mind so eagerly seeks and welcomes.

One cannot but admire the masterly manner in which natural obstacles have been overcome and utilized, and this exposition impresses one with a sense of stability and permanency that is as agreeable as it is unexpected, the permanent buildings of Washington University and the Art Palace contributing, of course, largely to this impression. To one who can comprehend how the natural features of the site have been utilized, what an intricate problem has been met and solved in the preliminary work, which has resulted in most complete drainage and service systems, the finest system of fire protection ever installed, and the enhancement of every vista to the utmost, candor compels the acknowledgment that none but master minds, working harmoniously for a common result, could have conceived and carried to a successful issue the huge problem here successfully met.

The magnificent distances one is so well pleased to find here are made vividly real when one is compelled to traverse those same magnificent distances on foot, in getting from point to point, as is the case at the Louisiana Purchase Exposition. Any other method of transit will rob the scene of its most potent influences.

In the matter of electrical effects, this exposition can be pronounced a success, although the effect is enhanced by mere size very largely, and it is painfully apparent that many of the buildings have been "skimped" in this direction. They are not as effectively outlined as was the case at Buffalo, and the entrancing effects there attained, where the real buildings melted away into a dream picture, is not realized at St. Louis. The novelty of the scheme, too, is lacking here, and the romantic element is absent; an element, say what you will, that enters very largely into every successful art essay.

MAIN CASCADE IN FRONT OF FESTIVAL HALL

The picture presented by the cascades, fountains, etc., especially at night, is the peer of anything of its kind ever produced by the human mind. Parisians who have seen it for the first time have enthusiastically admitted this, and he must be a dullard indeed whose pulses are not perceptibly quickened at so beautiful a composition. But, after all, the impression is not so much that of vigor and power, as was the case at Buffalo; it is rather that of a gentle overflow from basin to basin, and the fact that huge machinery is doing all the work and generating the electricity, removes the very potent element that made the Pan-American display, where Niagara, some nine or ten miles distant, did most of the work, so charming.

Landing at the Minneapolis & St. Louis station, a temporary structure according well with the general character of the Exposition, one emerges directly opposite the Lindell avenue entrance, passes through the turnstiles, and finds himself in a plaza which leads direct to the Grand Court, or Plaza St. Louis, where the main buildings spread out fan fashion, converging at Festival Hall half a mile distant and elevated some 65 or 70 feet above the level of the plaza. Advancing between the Manufactures' and Varied Industries' Buildings to the Louisiana Monument, on the main axis of the composition, one has three splendid vistas to charm and delight him. Before him is the Grand Basin and Cascades, with Festival Hall and its swinging terraces and pavilions, the crowning and central feature of the picture, most satisfying to the lay and artistic mind above him:—(one of the most

LOUISIANA PURCHASE MONUMENT

regrettable features is that the splendid Art Palace is screened from observation from this point of view)—to the right are the Electricity and Varied Industries' Buildings, with a vista opening between to the French and Forestry Buildings, a mile distant. To the left are the Educational and Manufactures' Buildings, and a vista which is closed by the Government Building, which is elevated some 40 or 50 feet, and in both pictures are picturesque lagoons spanned by artistic bridges and livened by various sorts of water craft.

VISTA TO LEFT OF MONUMENT

A most enchanting foreground to the Government Building is secured by a sunken garden, making an impression never to be forgotten, particularly when one remembers that the Government Building is one of the very best architectural compositions on the grounds, and is so placed as to enhance its value to the utmost. The lagoons are much broader than was the case at Buffalo, and the Grand Basin is of truly noble proportions. The position corresponding to the sunken garden in the vista to the right is occupied by the Machinery Garden, a vast floral garden in the midst of which the Banda Rossa discourses sweetest music every afternoon and evening, carrying the writer back to past pleasures at dreamy Lake Harriet.

The above description includes the principal buildings, the heart of the Exposition. The important buildings, aside from these, are those of the Agriculture, Horticulture, Forestry, and Administration, all of which lie to the west, or right, of our point of observation. In this region are also the foreign buildings, mostly reproductions of famous buildings, giving a characteristic tone in each, which I shall not describe in detail. On the extreme left is the Plateau of States, where with few exceptions are structures offering rest and home news to the weary pilgrims from every quarter of the land. It is regrettable that Minnesota is not represented by a building more to her credit, the site being a prominent one, exciting much adverse criticism because of the contrast with neighboring states. The uncomfortable crowding of state buildings at the Columbian Exposition is happily

THE SUNKEN GARDEN FROM GOVERNMENT BUILDING

lacking here, every one having ample room and good setting, enhancing its good points most agreeably.

A Model City occupies the territory immediately facing Manufactures' Building. Here is located the Twin City building, which is a credit to both Minneapolis and St. Paul. It contains models, photographs, and drawings, which portray vividly the environment and best features of each city and the country surrounding.

At the time of my visit the American Institute of Architects was due to meet, and a few representatives were there from the East, including Messrs. Andrews of Boston, Stone of Providence, and Glenn Brown of Washington. The outside attendance was so small that the program which the local architects had planned was abandoned, the thing simmering down to a "spread and smoker" at the House of "Hoo-Hoo," on Wednesday evening, at which about 40 were present, and a good time enjoyed. This building was destroyed by fire early on the following morning, so it is reasonably safe to say that a "warm time" was enjoyed at that "spread." The building is now being rebuilt and will be turned over within thirty days as it

first stood, excepting the California woods used in its finish. It is of the bungalow type, with broad verandas, and is entered as part of the forestry exhibit, nearly every variety of wood found in the United States being used in its construction and finish.

Minnesota has creditable exhibits in the Educational and Forestry Buildings, and has taken the big prizes in the dairy and wheat producing departments. Her display in the Horticulture Building is also something to be very proud of. It is a great pleasure to realize the success of the Fine Arts Building, the one permanent building of the exposition, as it was designed by our State Capitol architect, Cass Gilbert. The main hall of this building with its tiled ceiling is particularly successful.

The grand organ in Festival Hall is an exhibit through the Liberal Arts department, from Los Angeles, Cal., covering 62 by 33 feet, 40 feet high, with 5 manuals, 140 speaking stops, 239 movements, and 10,559 pipes. It was the writer's pleasure to hear a recital upon this instrument by Prof. Andrews, of Oberlin. Owing to the immense size of Festival Hall, this organ does not appear unduly large, and its tonal qualities are admirably suited to the hall. Recitals are given daily by noted organists and composers, among whom Guilmant of Paris is announced during the fall.

The Philippine exhibit is vast, interesting and educational. The Boer War, Jerusalem, Athletic Field, Indian Village, Inside Inn, and last, but not least, "The Pike," will all appeal to the searcher for novelty and entertainment. It is common report that the best restaurants and the best sights of the show are found on "The Pike," so that one who fails to see this misses the best of the show, for human nature is seen here at its best.

After all has been said, the features of the exposition which appeal most strongly to the cultured mind, those whose effects are most uplifting and enduring, are the great works of the architect and landscape artist.

Unquestionably the solution of the problem is most happy, and the effect upon the mind most inspiring. The educational value of such an exposition is beyond calculation, as the progress from the old Centennial of less than thirty years ago to this, will testify. It goes without saying that such an undertaking would be impossible without government aid. It is a fact that such enterprises have never paid, financially, and it is not anticipated that this one will be an exception to the rule. It is generally understood that this will be the last exposition to which the government will be a party. Assuming the truth of this, it behooves all who can possibly arrange it, to visit and enjoy the Louisiana Purchase Exposition, especially those who reside in the Mississippi valley and are closely identified with the Middle States and their interests.

A most gratifying feature is the unusually comprehensive exhibits made by foreign nations, particularly those of Germany, France, Italy, Sweden and England. The educational exhibits are an inspiring object lesson of our development, both at home and abroad, promising a larger and more useful future to the coming generations, and straining the credulity and imagination in attempting to foresee the possibilities and privileges which those who follow us will enjoy because of the faithful, unselfish work of their forefathers.

FLORAL DECORATIONS AROUND FESTIVAL HALL

SPECIALISTS IN ARCHITECTURE.

Specialization has made great strides in the profession of architecture. Time was when a single architect with skilled assistants planned and designed buildings from cellar to roof, consulting an architectural engineer, perhaps, if the work was of such size and form as to involve serious engineering problems. Then came the era of architectural firms. One member of such a firm would be specially skilled as a designer, the artist of the combination; another acquainted with materials and methods of construction, so that he was able to superintend the work of the contractors; a third good at specifications or perhaps specially rich in friends and able to deal with clients.

Architectural firms in which men of various gifts participate are still numerous, but specialization has developed independent architects who are consulted by many firms upon special problems. There are men who do little or nothing but write specifications, and others who are employed by many of their fellow-architects in preparing the colored drawings intended to make unimaginative clients see how a building will look when completed. Architectural engineering is more than ever a profession in itself. Meanwhile the architectural draughtsman has also had his develop-

RESIDENCE OF JAMES S. LA PRELLE, ST. LOUIS, MO.
H. F. Roach, Architect, St. Louis

HALL IN RESIDENCE OF JAMES S. LA PRELLE, ST. LOUIS, MO.
H. F. Roach, Architect, St. Louis

ENTRANCE TO JAMES S. LA PRELLE'S RESIDENCE, ST. LOUIS, MO.
H. F. Roach, Architect, St. Louis

MANTEL IN DINING ROOM OF JAMES S. LA PRELLE'S RESIDENCE, ST. LOUIS, MO.
H. F. Roach, Architect, St. Louis

MANTEL IN RECEPTION ROOM OF JAMES S. LA PRELLE'S RESIDENCE, ST. LOUIS, MO.
H. F. Roach, Architect, St. Louis

DINING ROOM IN RESIDENCE OF JAMES S. LA PRELLE, ST. LOUIS, MO.
H. F. Roach, Architect St. Louis

EVANSTON BUILDING, MINNEAPOLIS, MINN.
Earnest Kennedy, Architect, Minneapolis

C. F. Haglin, Contractor

RESIDENCE OF JOHN H. DORNER–LOWERY HILL–MINNEAPOLIS, MINN.
Lowell A. Lamoreaux, Architect, Minneapolis

ment. English architects are surprised to find how large a share of important work in the offices of New York architects is left in the hands of so-called draughtsmen. These are often carefully educated young architects who hope sooner or later to set up independently or get into some established firm as junior partners. In some cases a draughtsman develops into a sort of managing clerk, just as some law clerks become the executive officers of important law firms.

Other draughtsmen are prized for the taste and skill in decorative design. Such men are sometimes employed to do a large part of a competitive design submitted for important buildings, public or private. However little the employing architect may have advised in this work, he and not the designer gets the credit, and the prize, if it is successful. New York has few such architects as have attracted special attention in England by methods unusual in this country. The English architects in question are men who work largely alone, having no partners and employing few draughtsmen. They do not seek to create a great business, but are content to build comparatively few houses. They do, however, place their individual mark, not only upon the general design of the houses they build, but upon every detail. This method of work makes it impossible that they should entrust to hired draughtsmen a great variety of details such as in this country is done by draughtsmen.

This architect works almost purely as an artist, with jealous care that nothing shall go out from his office that he is not ready to father in all its important details. Such architects do not earn great incomes, for the comparatively small volume of the business makes that impossible; but their fees for individual houses are relatively large, and only the well-to-do can employ them. Their work is known all over the British Isles and even in this country. The few American architects who work in this fashion attract less attention than like men in England.—Exchange.

STRIKES IN RUSSIA.

When strikes occur there is no delay in dealing with them. Troops are mobilized at once. The printers in Moscow, for example, struck last autumn. The strikers marched in procession along a few streets, clamoring for shorter hours. They complained that they had been compelled to work overtime, and that no compensation had been given for the extra labor. General Trepor, chief of police, issued a notice that any man refusing to return to work would be excluded forever from Moscow. This stopped the movement. Such notices have stopped similar movements elsewhere.—The World's Work.

ONE PHASE OF LABOR UNIONS.

When he reached home he drew a large roll of notes from his pocket and tossed it over to his wife.

"Better go shopping," he said. "Get some of the things that we thought we could not afford."

"Where did you get the money?" she inquired.

"I drew it from the savings bank," he replied. "There's no use trying to save anything now."

"Why not?" she asked.

"I've joined the union," he explained.

"Joined the union!" she cried.

"Yes; I had to do it, so we'll have to spend this money in a hurry if we don't want to get the worst of it."

"Why?" she persisted.

"Oh, I'll be on strikes of one kind or another most of the time now," he said, "and when I'm not striking I'll be paying strike benefits. The money is bound to go, and I want to be in a position to get as much out of the union as anyone. If I have money in the bank there will be no strike benefits for me when I'm ordered to quit work. 'You don't need it,' they'd say, 'for you've got money. We can only afford to make payments to those who haven't any.' You see, there's a penalty put on thrift and a premium on thriftlessness. The man who saves has to pay himself for the time lost at the order of the union, and the man who doesn't save gets the help. In a year from now our money will be gone anyhow, so we might as well spend it while we can get some personal advantage out of it and then come in on even terms with the others for the strike benefits. It's the man who hasn't anything and never expects to have anything who gets the advantage. Take the money, Maggie, before it gets beyond reach. You helped to save it and the union will only help us spend it if you don't do it first."—Daily Press.

NO TIME FOR FOOLS.

When George Westinghouse, as a young inventor, was trying to interest capitalists in his automatic brake, the device which now plays so important a part in the operation of railroad trains, he wrote a letter to Commodore Cornelius Vanderbilt, president of the New York Central Railroad Company, carefully explaining the details of the invention. Very promptly his letter came back to him, indorsed in big, scrawling letters, in the hand of Cornelius Vanderbilt —"I have no time to waste on fools."

Afterwards, when the Pennsylvania railroad had taken up the automatic brake and it was proving very successful, Commodore Vanderbilt sent young Mr. Westinghouse a request to call on him. The inventor returned the letter, indorsed on the bottom as follows: "I have no time to waste on fools."—Success.

VARNISH: ITS DEVELOPMENT, MANUFACTURE AND USES.

By Ira J. Ackerman, Chemist.

With PRATT & LAMBERT.

The manufacture of varnish, as it appears on the market today, is not the result of any one experiment, but represents the continual development and evolution of at least twenty-three centuries. It is, therefore, one of the oldest of the world's manufactures, and the making of varnish today gives employment to a great many men, to say naught of the painters and finishers who spread the varnish for the double purpose of protection and beautification.

For the derivation of the name, and much of the early history, I am indebted to Mr. Robert Ingham Clark, well known in this country and Europe for his profound scientific knowledge of all the materials used in our business. Mr. Clark says that the etymology of the word varnish is rather involved and obscure; some claiming it from the Latin "vitrinire," to glaze, and "vitrum," meaning glass. Mr. Clark, however, inclines to the belief that, although the derivation is Latin, the root is "vernus ros," signifying the vernal dew; hence, the French "vernis" and the easy transition into the Anglo-Saxon varnish.

By varnish, we understand any liquid which, when flowed or brushed over a solid body, imparts brilliancy and lustre by the combined optical effect of reflection and refraction.

It must not be inferred from this that the sole function of varnish is to beautify; on the contrary, many varnishes are made with comparatively little regard to their lustre, as compared with the care that is taken to make them durable.

Leaving out of consideration the pre-Christian use of prepared resins and balsams in the mortual wrappings of the Egyptian mummies, found in the pyramids at Thebes and elsewhere, the first use of a varnish of which the date can be fixed with any degree of certainty is about 350 B. C. by Appeles. Pliny, the great historian, tells us that Appeles was a famous artist of ancient time who did not belong to either of the four great schools of the time (Sicyon, Corinth, Athens and Rhodes), but combined the excellent coloring of the Ionian with the accurate drawing of the Sicyonic school, and that some of his paintings were hung in the great Temple erected to Diana at Ephesus. From the chronicles which have come down to us we can appreciate the reverence which was paid to the pagan deities, and the Ephesian temple to Diana was known throughout the length of the land for its magnificence and the excellence of its works of art.

Pliny states in this connection that Appeles invented a varnish the composition of which was secret and known only to himself. Thus we see that varnish was known and used successfully at least 2,250 years ago. Of the nature of this varnish we know nothing. The paintings on which it was probably used are all destroyed, and there is no means of determining the character of the varnish that Appeles used.

The essentially war-like nature of the people of his time and the almost continual international wars being waged in the interests of empire furnished no reason for the use of such a protective and beautifying coating. Therefore, though the people had in their hands for a long time the material to produce varnish, the lack of a specific object precluded its manufacture.

In time, as the ancient nations became more settled, they gave up their war-making and turned their attention to the arts of peace and industry and it was but natural that here should arise, partly from necessity, but more probably from a taste for the luxurious, a sustained demand. This was furthered by commercial intercourse and the development of varnish making was begun.

The use of lacquers in Japan was begun at a very early period (probably prior to 392 B. C.), but these must not be confounded with the varnishes already mentioned, for there is no trace of any connection whatever. These lacquers were made from the crude sap of the lacquer tree (Rhus Vernicifera) after being manipulated in various secret ways known at first only to the priests and officials of the Empire. The effect produced by the use of these lacquers is particularly beautiful and they are quite durable, though very brittle. The mode of application is very elaborate and extraordinary, involving the use of a large number of coats or applications and final polishing with some sort of oil rubbed on with the finger. The work seems to have been very expensive and only possible for the extremely wealthy.

The making of varnish as understood at present in Europe and America is of comparatively recent date, and consists in the discovery and application, practically, of certain formulæ and methods of working which every manufacturer keeps secret.

A reputation in the field of varnish making is not built in a day, but is the result of years of costly and systematic experimenting by expert men who are specially trained for the work. In addition there must be absolute uniformity in the goods turned out, and this, too, requires the application of scientific skill of the highest order.

While it is true that some firms send out varnish without careful testing, made from raw materials which are not analyzed before use, it can be readily seen that it is only by the most painstaking attention to minutæ and constant watchfulness that a perfect product is always obtained.

To do this successfully requires the installation and maintenance of large chemical and physical laboratories in connection with the works. All raw material entering into the manufacture must be carefully analyzed before use in order to be certain that a high standard of purity is always maintained.

Fine varnishes must be stored and aged for a long time after making, and must be watched and tested from time to time, at all the different stages before it is finally allowed to be put on the market. This routine work is done in the physical laboratories, and ensures perfect control.

Another department that is only possible in the largest works is the practical finishing rooms in charge of an expert finisher, who carefully tests the varnishes as they are actually used and under the same conditions that obtain in commercial work. Here the varnishes are applied to all the various woods which are used in interior finishing, carriage, furniture and piano work and all the many ways in which varnish is used. Here also the large panels are prepared for exposure to the weather in order to determine their resistance to sun, wind and rain. Records are kept of all these series of tests and carefully filed for reference.

The manufacture of varnish is now so vast that it requires the employment of raw materials from all quarters of the globe. The fossil resins are imported in large quantities from Africa, the Philippines, South America, Java, India and Zanzibar. Before the gums are ready for use they must be carefully washed and sorted. The washing is done with common water, and removes any dirt which may be still adhering to the gum. The sorting or picking is an operation that requires skill and experience. The linseed oil used in the best grades of varnish comes from Calcutta, India, and is known as Calcutta oil; while that in the cheaper grades comes mainly from the Northwestern agricultural frontier in America. Turpentine, used extensively as a solvent or thinner, is extracted from the sap of the long leaf southern pine, of which there are extensive forests in the southwestern part of the United States.

The general method of manufacture is to melt the proper resin, or gum, as we term it in the factory, carrying the destructive distillation to a certain point which is only known after long experience, adding a certain amount of prepared linseed oil and then thinning with the proper solvent.

These prepared oils are all made from special linseed oil by adding differing amounts of so-called "driers" and cooking or digesting at different temperatures for different lengths of time. The driers used vary with different varnishes and are principally compounds of lead and manganese.

The function of the turpentine is to reduce the varnish to a body or consistency that will admit of easy application and also to facilitate the drying on account of the thinner film.

As has already been stated, it must not be considered that varnish is used solely in order that material treated with it may have a high lustre and look well. The uses of varnishes are many and various. New uses are being evolved constantly, and it is impossible, within the scope of this article, to touch on more than a few of the more important.

Perhaps the most important feature of varnish is applied strictly to interior finish. Next to the beauty that it adds is the influence on public hygiene. The use of the modern floor varnish and wood preservative is not only convenient and easy, but offers the most resistance to the lodgment of toxic germs. So important has this feature of an antiseptic condition become that nearly all the large hospitals and public buildings require that the walls and floors be finished with a varnish surface of some sort.

A good varnish is very adaptable, for by its use in connection with the proper stains any of the cheaper and more abundant woods may be finished by the skillful mechanic in almost perfect imitation of any hardwood. This important feature brings the use of mahogany, cherry, black walnut, and Flemish, English, light and dark oak, besides many other costly woods within the reach of all.

Spirit varnishes which dry quickly are made from alcohol and a suitable gum. These comprise principally shellacs and are valuable as first coaters, and to prevent sap and resin from coming through the subsequent coats of varnish.

Varnishes are used for a multitude of purposes. There are almost an endless variety of interior finishes; varnishes for fine carriages, railway coaches, furniture, and for all kinds of exterior work, both on land and water. Then there are varnishes which may be rubbed to a dull finish or polished for a very bright surface.

Each of the varnishes enumerated has its own distinct method of manufacture, which is the result of long experience and careful testing.

The making of varnish as conducted by the large varnish manufacturers is a scientific operation requiring skill and thoroughness. Not only must the actual operations of making be conducted uniformly and exactly, but the endless testing requires the use of methods which are original and unique. It is only by unceasing watchfulness that the successful varnish business is conducted.

Everyday stories of modern mechanical triumphs are calculated to drives tales of old magic from the lay mind. The reported mechanical feat of running a motor cycle for fifty-five miles on city streets with the expenditure of one quart of gasoline appeals to the unlearned very much like getting a good deal in exchange for next to nothing. Smooth pavements were selected, with little or no grade, and as a matter of course no great speed could be made, which would leave atmospheric resistance out of the count—after all of which has been said, it is hard to see how a quart of gasoline can do the work. The mechanical expert may be able to figure out how a well equipped railway can move a given load a longer distance with a less expenditure of fuel—making this performance of the motor cycle take second place in the comparison—yet he will hardly make the performance of the freight train appear so startling as the other to the novice.

BASILICAN ARCHITECTURE IN THE UNITED STATES.

While many Americans are preparing to flit abroad in search of the novel and inspiring in artistic structures and scenery, it is timely to call attention to a gem of ecclesiastical architecture long overlooked in the slums of Philadelphia. It is a Protestant Episcopal church, known as the Church of the Evangelists, and is said to be the only specimen of Basilican architecture in the United States. One might pass the exterior a hundred times without a thought of the wonders hidden behind the plain doorway. Once inside the entrance, however, and the visitor stands spellbound, for here, in the slums of an American city, is an edifice that suggests the ecclesiastical glories of an English cathedral. Almost every part of the exterior is an exact reproduction of some famous church abroad. A row of pillars stands at either side of the nave of the church. Each row supports a high wall by means of a semicircular arch. These walls rise to the roof, which was built over them.

On entering the church an observer, with eyes untrained to interior architectural perspective might at first think the area rather small, seemingly a miniature of that in some famous edifice; then he would face the rood screen, which separates the choir sanctuary from the nave, and here he would catch a glimpse of the altar and mural paintings and a high reredos. On either side are the Chapel of the Holy Scriptures and the Lady Chapel, the latter having a smaller altar.

Facing the sanctuary are interesting studies on the rood screen, which is after one in St. Mark's, Venice, with the figures of six saints on top. The screen supports a large cross. Frescoes on the high sanctuary wall picture the life of our Lord. The choir and altar place take up precisely one-third the length of the church proper. The seats of the choir, in heavy oak, have misericords, or misereres—curious little shelf-like seats under the seats proper. These were introduced in the early Middle Ages for the monks to half sit, half lean upon during the long recitations. In the Church of the Evangelists alone are they to be found in a Protestant church in all this country, it is said.

In a corner near the altar hangs a beautifully made icon, under the steady, soft light of a hanging lamp. Above and back of the altar rises a carved and gilded reredos, an exact copy of that painted in 1527 by Carlo Crevelli, now in the National Gallery, London. Here and there on the columns in the nave hang icons and richly executed crucifixes and examples of Robbia or Della Robbia ware. The church has a dozen specimens made by Cantagalli, the prevailing colors being blue and white. They were imported from Florence. Icons in the Church of the Evangelists are of gold and silver, with a miniature painting behind the metal, and are flat, about 10 inches square and set in frames. Similar to these were the icons the Puritans broke in the eighth century during the iconoclastic controversy. The Church of the Evangelists is said to be the only Episcopal church in America which has images with candles burning before them and icons with lamps.

The pulpit in this church, of various marbles, reminds one of that in the Ravenna Cathedral. The treasures of the church include numerous richly-jeweled crucifixes, a number of volumes of which the covers are thickly besprinkled with diamonds, rubies, pearls, emeralds, opals and other gems set in filigree work; the vestments and altar cloths are of rich material, gleaming with jewels.

Over the entrance door is hung a picture of King Charles I that has an interesting history. It depicts the monarch with a halo, he having lost his head, as some believe, for the good of the church. The painting was one of two made by the direction of Queen Victoria. One was sent to this country as a present to the King Charles Society and eventually found its way to the Church of the Evangelists.

The rector of the church, the Rev. Charles W. Robinson, when asked to write something about the edifice, penned the following:

"You ask why the Church of the Evangelists is not better known and more appreciated. 'A prophet is not without honor save in his own country.' This church is probably better known in England than it is here in Philadelphia. When the new edifice was commenced it was surrounded by houses occupied by some of the best people in the city, but long before the present elaborate decoration of the interior was even started the neighborhood had changed, and we are now surrounded by 50,000 Italians. To reach the church one has to pass through this foreign district, which some persons imagine to be unpleasant and even not secure. But this is an entirely erroneous idea.

"Again, as a rule, American people are not very keen after art for art's sake. We have, of course, many individual and notable exceptions, but the people in general have a slight appreciation of art. The distinction between ourselves and foreigners in this respect is marked. An American comes in and admires what he imagines costs a good sum, and no doubt if each article were labeled as costing a fabulous price, or were the gift of some millionaire, he would be full of admiration.

"Then the Church of the Evangelists looks like a building of the Middle Ages. It contradicts at every point the spirit of the century in church-building in America. It savors of the Dark Ages, a benighted period, which, while it gave birth to the greatest statesmen, philosophers, architects, sculptors and craftsmen, failed to produce a single man who could invent a sewing machine or trolley car. There are two ideas of a church building. Some look upon what they call their church as an auditorium; that is to say, a large hall in which the minister may be well heard when he tells God a great deal that has hap-

pened. For this purpose they believe a 'church' should be built like a theatre—for comfort and acoustics. So this, with the addition of good heating and ventilation, and seats from which the people may see everything, is the architect's chief aim.

"As an afterthought he adds what he thinks will give the building a churchly appearance. He puts pointed tops to the windows and a tower and a steeple in front, and then has the impudence to call this high-bred production a Gothic church. Now, the other and ancient idea of a church is that it is a building offered up to God, in which the Sacraments are to be administered, and especially the Holy Communion."

The Rev. Charles W. Robinson succeeded the late Dr. Henry R. Percival. It was Dr. Percival who personally superintended the reconstruction of the church in its present form. The building foundation was laid nearly 65 years ago, and the structure was rebuilt two decades ago.

VAULTS TESTED IN THE BALTIMORE FIRE.

Mr. Geo. L. Damon, in writing of the condition of vaults in the various buildings which were burned in the recent Baltimore conflagration, in the Architects and Builders' Journal, says:

"I have spent much time in the ruins minutely studying results, not only regarding vaults, but 'safes' in general. It was my privilege to personally inspect like work in Portland, Chicago and Boston, object-lessons from ruins aggregating an area of more than 650 acres, with losses upwards of $525,000,000.

"The contents of the 22 burned national and savings banks' and trust companies' vaults in Baltimore were in every instance found to be in perfect condition. A majority of the vaults were of comparatively recent construction (five being of my own fitting up). A few vaults were located in basements; others on first, and still others on second floors. In each case the fireproof protection was of surrounding walls averaging about 16 inches in thickness, built up solidly of hard brick laid in cement free of any built-in iron work strengthening. All the vaults were supported on brick foundations built up from cellar bottoms. Several of the vaults were unfavorably located, subjecting them to a degree of heat hardly imaginable. In one of the latter was found an illustration showing that at some time during its test the interior temperature had been sufficient to cause the upper portion of a candle left in the top of the safe to bend over and rest in the pan of its holder.

The contents of a large number of mercantile vaults were intact, but there were also many losses resulting from faulty and cheaply constructed doors, and in several cases where fairly good doors had not been properly secured to masonry; losses resulted also where vault doors and vault walls were so connected with the falling building walls that they fell with them.

There were no bank or mercantile vaults with fireproofing constructed of concrete, as some vaults have recently been constructed in other localities. The ruins show total destruction of plastic and coarse-mixture materials to an extent that would lead me to place unqualified reliance in no fireproof vault construction other than hard burnt brick, honestly laid in best cement. With good brick and cement furnished a mechanic there is not the possibility of improper work, as might follow in the formation of concrete. Both constructions costing practically the same, and considering the all-important fact that the only materials which resisted extreme heat were those manufactured by heat, such as brick and terra-cotta, the preference in construction is decidedly in favor of brickwork for absolute fireproof protection. Iron-work of any kind incorporated in or forming part of fireproofing structures, expanding, causes cracking and weakening of walls, vitally impairing their security in a conflagration of magnitude.

"Vaults properly constructed of brick on second and third floors, possess unquestioned security against such fires when built up on brick foundations extending from the basement, not substantially connected with the main walls of buildings and free of built-in iron work."

THE GROWING DEMAND FOR THE BEAUTIFUL.

The national talent of acquisitiveness, one of the most conspicuous products of our educational system —when directed toward the study of art—has awakened thousands of people to the appreciation of the role which art should play in life, says Charles H. Caffin, in the July World's Work. Countless homes reflect this in a greater propriety of decoration and furnishing than formerly; and, from the home, it has passed into the street. Churches, hotels, theatres, office buildings are being erected on all sides with, at least, a consideration for beauty of design and fittings. Commerce employs this element of beauty to enhance its own dignity and importance, and has discovered in it an asset not to be ignored. Even a regard for that larger element of design, which includes the planning of total effects, has begun to penetrate the public consciousness. At the Chicago Exposition it was seen how a concentration of effect and a union of similarity with difference conduced to the grandeur of the scene. And this new development of civic pride has reached right up to the top and effected a complete change in the attitude of the national government toward the erection of federal buildings. A thoroughly trained supervising architect, with a corps of first-class assistants, and the substitution of public competition for political influence, have resulted, of late years, in an extraordinary improvement in the character of these buildings. They are signal examples of the way in which the wealth and power of the country is expressing itself through artistic means.

SOME GOOD SENSE IN THIS.

What a vast amount of thinking, talking and writing has been done on the subject of labor adjustments! There are so many sides to the question, so many interests are involved, such an overwhelming number of different opinions expressed, that it is possible only to think of one phase of the question at a time to avoid being lost in the maze of confusing intricacies which present themselves to those who give the question consideration. We, in this country, have an important point to consider which does not appeal so strongly to trades in countries where work continues uninterruptedly throughout the entire year, and that is, the importance of discussing and arranging all matters connected with labor interests, etc., during the slack times of the season. It may be said that this is not possible, because if a basis of wages were struck and agreed upon, during the winter, when work, especially in connection with the building trade, is practically tied up, the power behind the workman would be weakened, but we must remember that the power would not be required if the men knew in advance just what footing they were on. There is not a contractor in the country to-day who does not believe in paying good wages to the men who show themselves capable, but how can he be expected to respond to a call for higher wages when he has already been compelled to take his work on a basis of prevailing charges? It is directly in the interest of the workman and those concerned, to foster and encourage the intentions of the understanding should exist between the contractor and the men he employs in his business before the season's work is entered upon.

In the discussion of no other question is so much bitterness engendered as in this one of wages and employer, and so much can be done in the way of removing his bitterness by arriving at an arrangement satisfactory to both parties at a season when there is time for mature and unbiased consideration. It should be the earnest endeavor of all parties concerned to foster and encourage the intentions of the building public to such an extent that there can be no obstacle in sight to the steady and unniterrupted operations during a season, which in itself is short enough for accomplishing all there is to do. It is well known that people will not build if there is any uncertainty before them. High priced materials can be faced and do not deter, because provision can be made to meet them, but if a man is confronted with the prospect of having his building, from which he probably expects to derive income, and which is already advanced in construction, stand for a length of time roofless or unplastered, he choses rather to abandon the project than engage with a proposition so full of anxieties. Now on the side of the workman can be said: First, he is entitled to wages that will enable him to meet the advanced prices of living, high rents and other increased expenses; he should receive sufficient to enable him to feel friendly to the work under his hand; he must be enabled to experience an interest in his work and demonstrate by its amount and quality that his apprehensions are at rest. Again, the workman's wage is established in the contractor's estimates, always in advance of the season's work, and if the workman himself had an opportunity of meeting with his employer and a satisfactory scale of wages were agreed upon, not only would a better feeling be promoted between them, but the public would have no cause for hesitating when considering their schemes for building investments.—The Northwest Contractor.

BEAT A BRITISH ELEVATOR.

"While on the other side this summer," said a man as he stepped out of an elevator on the ground floor of one of the tallest office buildings down town, "I had an experience that would startle any American.

"I was in Sheffield, England, visiting a friend. One day, while we were out walking, my friend said he had a little business to transact, and asked me if I would mind going along with him. I had nothing better to do, and went along.

"We stepped into an office building, which, I think, was about eight stories high. The building had an elevator, and we rode to the sixth story.

"My friend went into an office, and I told him that I would wait in a hallway until he had finished his business. When he came out I started for the door of the elevator. My companion stopped me.

"'Here,' he said, 'that won't do. This is the way downstairs,' and he started for the stairway.

"'What's the matter with riding down?' I asked.

"'Oh,' he replied, 'you can't ride down. The elevator only takes you up. You've got to walk down. The elevator never stops for anyone going down.'

"It was a new one on me, and I showed my surprise. I told my friend that in America an elevator would stop on any floor for you and take you up or down, just as you wished. He seemed surprised in turn, and said that it wasn't the custom there.

"'If you want to go to the floor above,' he said, 'the elevator will take you up, but you have got to walk down.'

"'Well,' I said, 'we'll try it.'

"So when the elevator came up I stopped it, and we got aboard and rode to the top floor. Then we made no move to get off, and it was the elevator man's turn to be surprised. When I told him that we were going to ride down he was shocked.

"Then I told him that I was a stranger and couldn't understand why people should be carried up and not taken down. It was just as easy to take passengers down as up, I explained. He said that time was saved by not stopping for persons going down, and that anyway a man could walk down without any exertion, whereas it was not so easy walking up.

"'How about a cripple?' I asked him.

"'Now you are talking,' he replied. 'We'd stop for him and take him down, but the sound in legs can walk.'"

UNIFORM BUILDING LAWS.

The International Society of State and Municipal Building Commissioners was recently organized at Washington, largely through the efforts of F. W. Fitzpatrick of that city, and formerly of Minneapolis and St. Paul, who was chosen its secretary. One of the first acts of the new organization was to inaugurate a movement to secure uniform building laws. No argument is needed to establish the proposition that the absence of all semblance of uniformity in the building regulations of the different cities and States is a decidedly unfortunate condition.

In a large country like ours, variations of climate and the character of the building material most available for use may prevent the establishment of absolutely uniform laws, and the greatly disproportionate size of cities may always necessitate some variations. In this question fire protection cuts quite a large figure, and the system in use, together with its efficiency, must of necessity exert an influence upon the controlling building laws.

In these days, when construction companies and private firms are taking contracts in all parts of the country, uniform laws would prove a decided advantage. An intimate acquaintance with the practical art of building is absolutely essential for one who is to make figures as to the cost of construction, and an acquaintance with the building laws of the city where the work is to be done is likewise of vast importance. It is true that copies of building laws of any city or State can be secured, but they cannot be mastered or even fairly appreciated at a glance, and time, when a bid is to be placed, is usually of the utmost importance. From the standpoint of the contractor uniform building laws would prove of decided value, and the same will apply to those desirous of letting contracts. In other words, uniform laws would tend to decidedly broaden the field of operations, not only to the mutual advantages of both of the contracting parties, but to that of the world of construction as well, since a broader interchange of ideas and methods would thereby be secured.

Such a system would likewise prove of distinct value from an insurance standpoint, permitting a better classification and more uniform rates of premium. From a legal standpoint it would also possess advantages, giving a better standard for the measure of damages and more accurate means for determining the rulings of courts. By broadening the field of operation it would greatly facilitate the general introduction of really valuable inventions and improvements pertaining to the building trades.

Adopted at this time, when there is a strong movement in the direction of fireproof construction, uniform building laws would give it a decided impetus, thus furnishing better protection to property and human life. The new society has started a crusade that is likely to meet with favor, and deserves to be crowned with success.—Architects' and Builders' Journal.

TURPENTINE.

It appears to be certain that a fairly good and acceptable quality of turpentine is being placed upon the market from an unexpected quarter; and if the reports as to the cost of production are true there may be enough of an output from this direction in the future to make a perceptible difference in the total supply of the commodity. This turpentine is being produced by distillation from the pine stumps which have hitherto been the bane of the pioneers who are endeavoring to clear up the land for agricultural purposes. It has long since been demonstrated that the quality of the soil and the climate of northern Minnesota, Michigan and Wisconsin are altogether excellent for diversified farming and stock raising; but the opening up of farms has been much retarded because of the enormous pine stumps which exist over great areas, and are extremely difficult and expensive to remove.

The turpentine industry as a factor in the aid of agriculture must be regarded as decidedly in its infancy thus far, but if the reports of results obtained are not exaggerated to an enormous degree there are certain to be numbers of small plants established at intervals throughout the former pine belt, which may result in placing upon the market a quite large aggregate of turpentine. Naturally, too, this will accelerate the development of these sections agriculturally, as it enables the impecunious settler to derive an actual profit from his stumps, in addition to preparing his land for cultivation.

The plant required for the distilling is described as being very simple, consisting of about four large tanks or boilers in which sections of stumps are placed for gradual heating. At the right temperature the turpentine in the wood flows downward into a pipe, and thence into a still. The turpentine in the wood being exhausted, the wood is then subjected to a higher temperature, which results in the extraction of the tar, which is conducted into another still. After the tar is in turn extracted the heat is further increased, and what remains of the wood is converted into charcoal.

It is said that a plant of four boilers requires only the labor of four men at low wages, and that it takes six days to make a run of twenty cords of stumps, producing more than 300 gallons of turpentine, upwards of twice as much pine tar, and five or six hundred bushels of charcoal. We are not in position to verify the figures, notwithstanding the reports made are quite definite. But it would certainly appear as though liberal discounts might be made from all figures and statements relative to plants now in operation, and still leave an excellent margin to the manufacturer. The cost of the plant is so slight that we shall undoubted hear more upon this subject before long.—Patton's Monthly.

SOME LARGE CHICAGO BUILDINGS.

The need for greater office building facilities in the congested downtown district of Chicago is being met by the construction of five large buildings which will require a vast amount of structural material. Some idea of the work involved may be gained from the statement that for four out of the five buildings the requirements are as follows: The Ryerson Building, Adams street and the Chicago River, 1,300 tons of structural steel; the Adams Building, at Adams and State streets, 2,500 tons; the Chicago Savings Bank, also known as the Otis and the Madison Building, at Madison and State streets, 1,400 tons, and the building being erected by Otto Young at the corner of Madison street and Wabash avenue, on the old St. Mary's Block, which will require 4,000 tons. The contracts for these buildings have been secured by Wells Brothers, while the George A. Fuller Company have placed the contract for 4,500 tons of structural steel for the office building to be erected by the Chicago & Northwestern Railroad at Franklin street and Jackson boulevard. Altogether these five buildings require over 13,000 tons of structural steel, besides a very large tonnage of castings and other iron and steel, and their construction is giving an impetus to the building interests of the city of Chicago that is welcome at the present period of comparative depression. —Carpentry and Building.

THE LABORING MAN'S LOT.

There is bitter complaint by the poor against the rich, and by labor against capital, says the Rev. Dr. Joseph Krauskopt, of Philadelphia. The phrase "the poor are steadily growing poorer and the rich are constantly growing richer" has become one of the glibe on the tongues of malcontents and agitators. It is true there is much poverty in our land—more than there ought to be in a land as rich as ours and among a people that counts so many multi-millionaires. Some of it is due to the oldest and most fertile source of all poverty, to idleness or intemperance or improvidence or disease, against which not even the richest land nor the highest wages are an effective remedy. Some of it no doubt is due to the rapacity of employers whose thoughts are but bent upon the largest possible profits to accrue to them from their investment, and not upon the starvation wages that fall to the lot of those that have an equal share in the production of wealth.

Yet never in the history of wage earning has the workingman received so large a return for his labor as at the present time. Never before have his working hours been so few or has his labor been so lightened by steam and electricity and mechanical contrivances. Never has his independence been so great. He is a free man in our day, often a freer man than his employer and often better paid.

With the exception of a few over-crowded and unskilled trades, the weekly wage of the average workingman suffices to provide him not only with all the necessaries, but also with some of the luxuries of life. Many a laborer enjoys comforts in these days that were denied to lords and princes not more than a century ago. It is said that some one expressed in the presence of Cobden "the hope that some day all people might become intelligent enough to read Bacon." To this Cobden replied: "I would be happy indeed if the time ever came when all the working people could eat bacon." This was said some sixty or seventy years ago. The time has surely come when the working people not only eat bacon, but also read Bacon and many another choice gustatory and literary morsel besides.

ARCHITECT, OWNER AND CONTRACTOR.

Mr. Wm. W. Emmart, writing to the Architects' and Builders' Journal of Baltimore, Md., says: With reference to your request for an expression of opinion on the practice of contractors furnishing drawings, as is now being done in some cases, more particularly large concerns, I can only say that the practice is a bad one, and in most cases detrimental to the financial interest of the owner, and in all cases to the artistic side of the question.

The architect's profession is in no way guarded by law, as is that of the lawyer or doctor, and anyone may call himself an architect, thus, there are poorly prepared men in the profession, and there may be, on the other hand, well prepared men employed by structural firms, yet this is still no reason or excuse for such methods.

The owner should in all cases when selecting an architect, assure himself of his fitness and artistic skill before giving the order to proceed.

The conscientious architect's endeavor is to secure for his client all that can be gotten for a given sum and the conditions imposed, while the attitude of the contractor is to give as little for a given sum as possible.

This is all there is to it, and means no reflection upon the honest contractor either.

Further, no one can tell, unless far better acquainted with prices for labor and materials than the average business man, whether he is getting all he can for his money, except by competitive bids from several contractors of nearly equal standing.

One of the largest buildings in the country is today, I understand, in litigation because a structural concern financed the work, supplying architect, capital, etc. Where an architect is so employed, he is not the agent of the owner but against him, and is usually not a free agent, either, as he merely makes the drawings and does not see that they are carried out.

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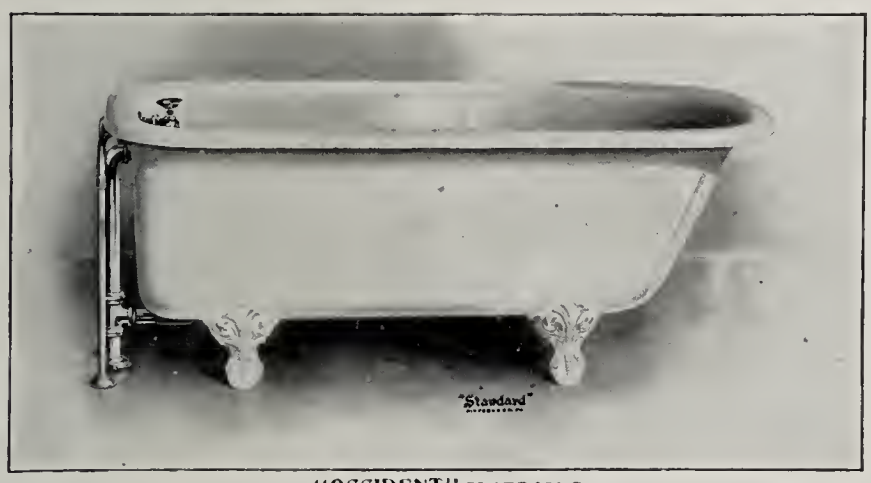

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