

THE SOUTHERN ARCHITECT.

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VOL. IV. No. 5.

ATLANTA, GA., MARCH, 1893.

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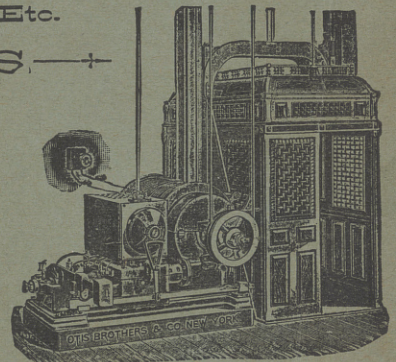
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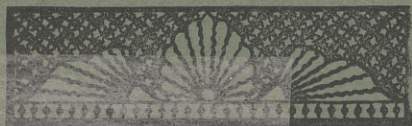
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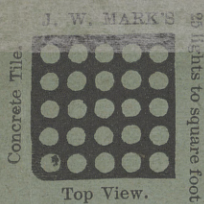


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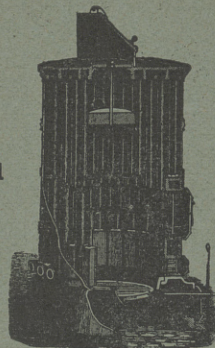
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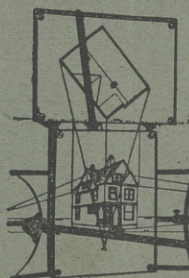
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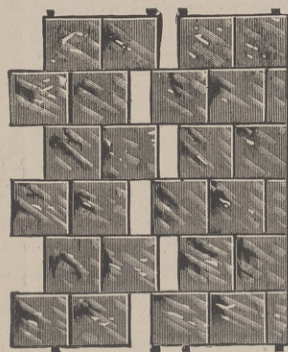
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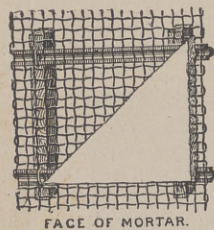
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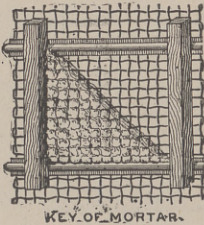
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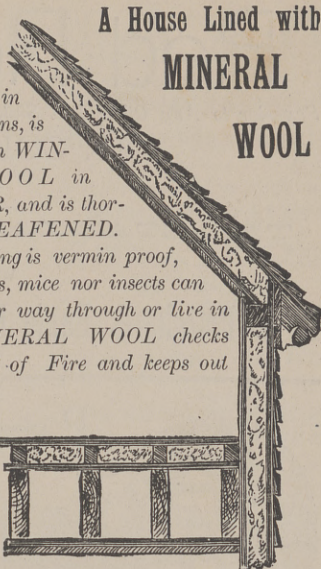
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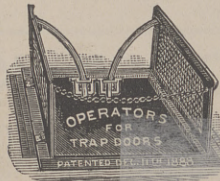
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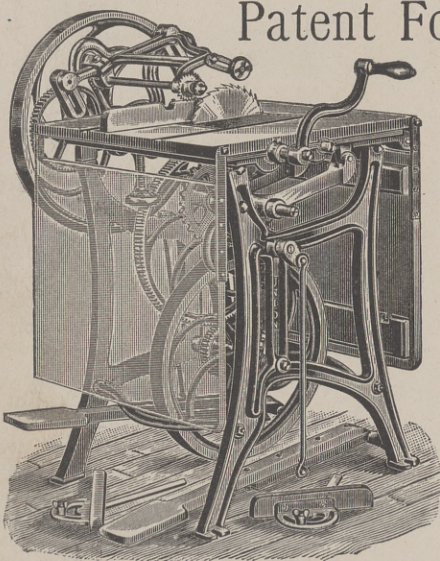
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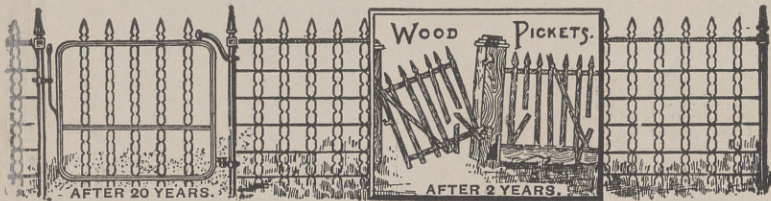
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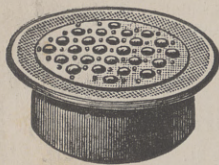
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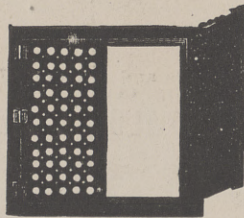
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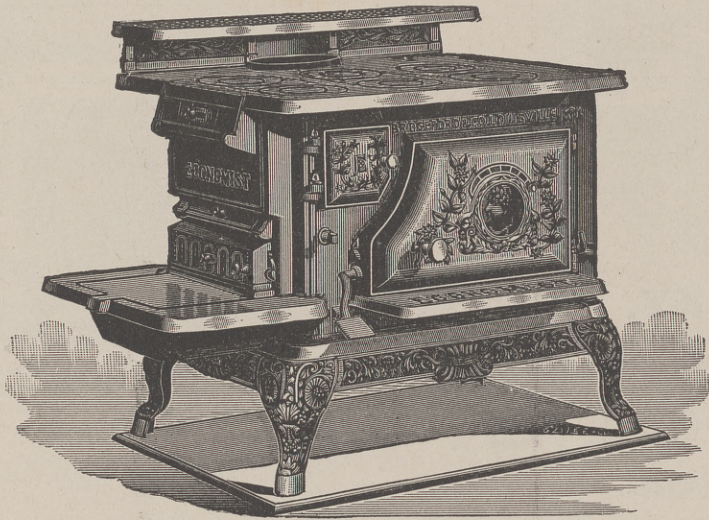
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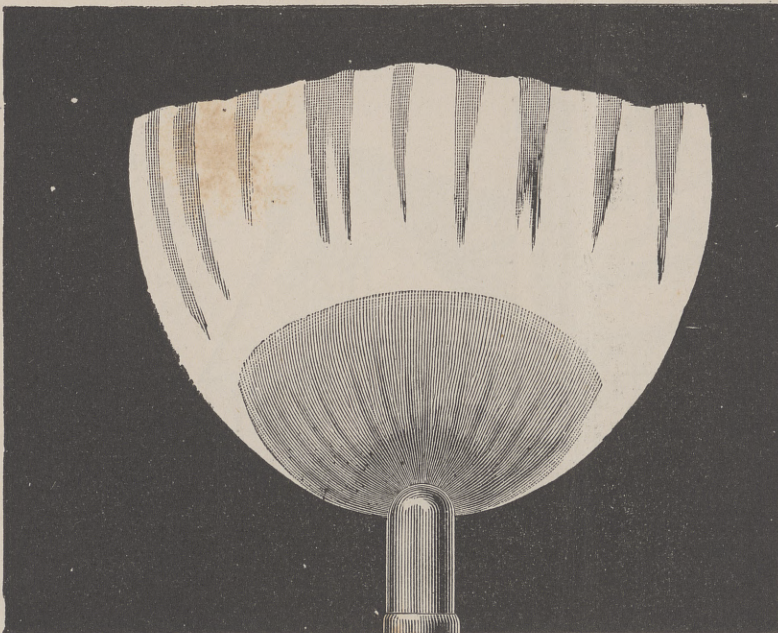
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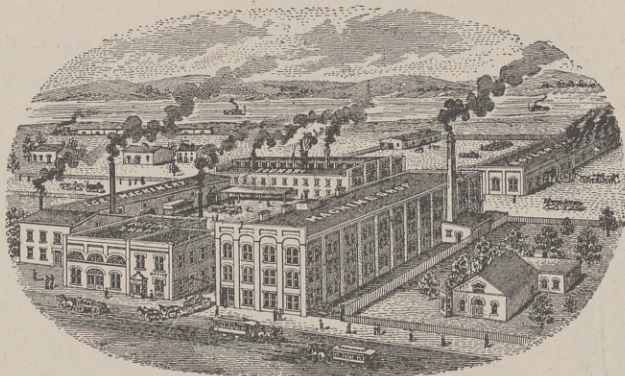
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VOL. IV.

ATLANTA, GEORGIA, MARCH, 1893.

No. 5.

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CHANGE IN THE MANAGEMENT OF THE SOUTHERN ARCHITECT.

WITH the present number THE SOUTHERN ARCHITECT, hitherto under the able management of Mr. Geo. W. Harrison, of the Franklin Publishing Company, passes into the hands of Mr. H. G. Saunders, who has secured a controlling interest and assumes the entire management.

Mr. Saunders is the Secretary of the Atlanta Chamber of Commerce, and also fills the position of Secretary of the Commercial Club of this city. Mr. Saunders has had an uninterrupted experience of twenty years as a publisher in various fields, chiefly, however, in our distinctive line, and the prestige which the new manager's various public positions and affiliations gives, and the well known energy which he has displayed in his enterprises, certainly offer assurance that his connection with THE SOUTHERN ARCHITECT will largely benefit it, and increase its usefulness and influence.

A number of new features which will add to its attractiveness are under consideration and will be carried into effect at once. A weekly supplement of advance "Building news" has already been established, and will be a permanent addition henceforth. Aside from this change in the management, no change in the personnel of THE SOUTHERN ARCHITECT staff will be made.

WORK on the new Simplon tunnel has been commenced. When completed it will be the longest tunnel in the world. It will extend from Brieg, in Switzerland, to Isella, in Italy, and its total length will be twelve and one-half miles. It is expected that from eight to nine years will be occupied in the construction of the tunnel.

M. J. CLAYTON & Co., the well known architects of Galveston, Texas, conclude a business letter with the following pleasant paragraph: "We are glad to see your journal in the front rank as the official paper for the Southern Chapter of the A. I. A. We wish you success, as well as success to our new organization of the Southland."

STONE, that elegant illustrated monthly, published at Indianapolis, in its February number says there are frequent demands for views of modern buildings in the construction of which stone enters. In response it reproduces two beautiful illustrations of elaborate stone entrances furnished by THE SOUTHERN ARCHITECT, and which appeared in our columns last year. These designs are by Messrs. M. F. Morris and W.G. Rawles, of the Atlanta Architectural Sketch Club, and are fine specimens of artistic work.

EDITORIAL

CONTENTMENT.

Ambition, in the end, the goal will miss
For which it strives, in wanton pride's excess;
Contentment—Heaven! I pray thee grant me this—
Contentment only is true happiness.

—CHARLES W. HUBNER.

Atlanta, Ga.

SILVER tubes for holding the large red and blue pencils used by architects have been provided.

THE preliminary surveys and borings for the magnificent bridge to be built across the Mississippi near New Orleans are in progress, under the direction of Engineer J. L. Armstrong, of Memphis. Borings one hundred feet below the low water line are being made; the boring for the two great channel piers will go to the depth of two hundred feet. Mr. Corthell is president of the company, and has general supervision of the work. The central span and the piers supporting it will doubtless be the largest in America.

It is a pity that the bill now in the Senate to authorize the Secretary of the Treasury to obtain plans and specifications for public buildings to be erected under the supervision of the Treasury Department, and providing for local supervision of the construction of the same, failed to go through at this session. The sooner the bill becomes a law the better for the credit of American architecture, which has suffered more from the ignorance and incompetence of the pretenders employed by the Government as architects than it has from all other sources combined.

Boston and Chicago are now in daily telephonic connection—the length of the wires is 1,250 miles. It works splendidly. Commenting upon this latest achievement, the *Scientific American* remarks:

"The possibilities it holds for the future cannot well be overestimated. A step beyond Chicago and the banks of the Missouri will be reached, and we may yet see Omaha and San Francisco connected by a line which will form the final link in a chain bringing San Francisco and New York within speaking range of each other. When conversation is carried on perfectly as it now is over 1,250 miles of wire, the extension of distance becomes a matter of detail."

Now that the Bell telephone patent has expired, telephony is open to the people, and the spirit of invention will have unlimited scope. We agree with the *Scientific American* in regard to the possibilities of the telephone in the future so thoroughly, that we do not hesitate to predict that telephonic communication from one end of the globe to the other will be established before two decades have passed, and that thus it will become the world-rival of the electric telegraph.

In the matter of the defective flue, the opportunities for the concealment of dishonest work are, and always will be, a temptation to certain types of workmen. It is presumed, and certainly not without a right to do so by every man who contracts for the building of a house or mill, that what he pays for is or will be done as it ought to be. His faith and cash go together in too many instances to find that the first was misplaced and the second thrown away. Incompetence on one hand and dishonesty on the other are by no means limited to natural fools, or rascals born with a kleptomania instinct, while both are eligible for weekly wages and the profits of a fat contract. The defective flue is an evidence. It has the advantage of being unsuspected and hiding its sins behind plaster, decorative panels and wall paper, while in the event of a fire the proof of the cause is by no means easy. In these times of city building and gregarious assimilation of stores, offices, hotels and workshops, it is more than ever necessary that all danger of fire should be minimized, and perhaps a critical eye on the construction of a flue might save the public fireman from singeing his whiskers and some burnt-out merchant or mill owner from seeing his fortune calcined with his bricks.

THROUGH the courtesy of Sidney Root, Esq., of this city, THE SOUTHERN ARCHITECT is enabled to give in this number an illustration of the exquisite bronze bust of his famous son, the late John W. Root, of Chicago. The bust is by J. Eilert, the sculptor, and is placed in the Gallery of Fine Art, at Chicago.

Mr. J. W. Root was born in Lumpkin, Georgia, January 10, 1850. He came to Atlanta in 1857, and went to school under Prof. A. N. Wilson. In 1864 he ran the blockade, and studied three years in England. He returned to New York and graduated from the University of the City of New York. He studied his profession under Renwick, and went to Chicago after the great fire. He was unanimously elected chief architect of the Columbian World's Fair in January, 1890, and died January 15, 1891.

THE display to be made by Germany at the Columbian exhibition will be very large. The appropriation of the German government for fair purposes is larger than that of any other foreign country, and the list of German exhibitors now contains 5,077 names. Represented in it are 230 cities and towns of the empire, and of these 40 cities send more than 10 exhibits each. Berlin leads with 283 exhibitors; Munich follows with 187; Leipsic with 149; Frankfort, 55; Hamburg, 57; and Chemnitz, 41.

Nearly \$6,000,000 has been appropriated by foreign governments and about \$3,000,000 by the several States of this country for appropriate representation at the Fair. Twenty-nine States made appropriations; only three States of the South are included in the number. Georgia, of course, is the most conspicuous of these by her absence. The South is making a very deplorable mistake in this matter.

MR. FERNOW, Chief of the Forestry Department at Washington, has published the result of the investigations made as to the effect of tapping for turpentine on the timber of the tapped long leaf pine tree. The manner of these tests was described in THE SOUTHERN ARCHITECT several months ago. The results were very valuable to the timber industry of the South. It has been proved that the tapping of the trees does not in the slightest degree cause deterioration of the lumber value of the trees, as was hitherto maintained. Mr. Fernow emphasizes this point strongly in the published official circular. "This refers," says the circular, to its mechanical as well as chemical properties, and hence even the reservation that it might suffer in durability is now eliminated and any prejudice against the use of bled timber in construction, wherever the unbled timber has been considered desirable, must fall as having no foundation in fact, being based only on vague belief, proved to be erroneous.

"It is to be hoped that this fact will be made widely known among builders, architects and engineers who have hitherto made discrimination against bled timber and thereby depreciated or discouraged the manufacture and impeded the sale of an article which answers all the purposes of construction and the unrestricted use of which is dictated by true economy."

The practical value of these experiments and of its results, cannot be overestimated in its relations to the building trades. It is to be hoped that the circulation of this information among those who direct the use of this commodity, and who hitherto have made discrimination against the bled timber, will turn sentiment in its favor, and encourage its manufacture and sale.

The total cost of the Suez canal exceeded £20,000,000.

NATIONAL ASSOCIATION OF BUILDING COMMISSIONERS AND INSPECTORS.

THE fourth annual session of the National Association of Commissioners and Inspectors of Buildings was held in St. Louis last month, simultaneously with the meeting of the National Builders' Association, of the proceedings of which mention is made elsewhere in this number. The presiding officer, Mr. Hazen, called attention to the fact in his introductory remarks that, although the organization was yet in its infancy, great good had already been accomplished. An association such as this is capable of accomplishing great results as to methods of construction, safety, symmetry and durability of buildings, and must necessarily add to the strength and character of the nation. The immediate object of the organization is the diffusion of knowledge as derived from experience concerning laws regulating and controlling the science of mechanics.

Charles E. Supplee, representative and Inspector of the Bureau of Building Inspectors, Department of Public Safety, Philadelphia, presented a paper on "Fire Escapes." The question of providing for fire escapes by legislation, he said, dated back only fourteen years, when the first State law was passed by the legislature of Pennsylvania. No specifications were made regarding the kind to be used, and those put in operation in obedience to the law were varied in character, and in many cases almost useless. It was not until 1885 that the law was so amended as to provide for proper and safe fire escapes to large buildings, factories, hotels, etc., and now outside stairways only can be used there according to the law. In conclusion he suggested that it should be made a penal offence to have a lock on any door or window leading to a fire escape; also, that some action should be taken toward devising means of escape in case of fire in dwellings.

Building Commissioner George B. Reed gave a paper on "Limitations of Heights of Buildings," which excited much discussion and evoked considerable interest. Among other things he thought that Building Commissioners should be empowered to demand borings showing the substrata upon which it was proposed to build, and with which to gauge the undisputable safety of the method used in securing a foundation. He had in mind, he said, several pretentious buildings erected in St. Louis by architects of unquestioned ability, having features which, while not immediately dangerous, were liable to prove so at any time. He also spoke of the unpleasant effect of enclosing a sixty or eighty-foot street with buildings possibly two hundred feet high, as during the winter months, when the smoke hangs over the city, such streets would almost turn day into night, and traffic would be seriously impeded. Steel skeleton construction, as far as tested, he approved of, but what the possible effect the expansion and contraction of the metal would have on the brick or stone work forming the outside walls was still a matter of conjecture.

Absolutely incombustible material, he thought, should be used throughout in the construction of high buildings; that such material should be specified, and that a limit should be placed on the projection of cornices. Incompetent men and architects in charge of high buildings constructed of steel, he said, were a constant source of danger, since the plans were frequently incomplete and the construction difficult to understand.

In the discussion which followed the reading of this paper, N. G. Fitchey, of Indianapolis, stated that the distance between stories in high buildings in Chicago was not more than nine feet, while those in St. Louis were

at least three feet higher. This, of course, made a great difference in the height of a building.

The Association adopted a resolution that buildings for the care of children and invalids should not be more than two stories in height, unless constructed of fire-proof material.

The Association will meet in Boston next February.

It is to be regretted that in the hurry and excitement usually attending the closing days of Congress that the Tarsney bill, providing that the work of public buildings shall be intrusted to private architects, under proper restrictions of the United States Supervising Architect's Office, did not receive its finishing touches and become law. The amendment attached to it by the Senate required it to go to a conference committee, and had there been time the modified bill would have easily passed both houses. As it is, the unfinished bill will lie over to be perfected and passed at the next session of Congress. Members of Congress are heartily in favor of such a law, and it will soon become a welcome addition to our statutes. The effect of this law will be most beneficial to the interests of architecture in this country, and will in future prevent the erection of important public buildings in the United States, whose clumsy and inartistic construction and mongrel style have disgraced us in the eyes of educated foreigners, and have served to retard and depress the healthy aspirations after beauty and symmetry which should characterize our national architecture.

SENATOR MORGAN, of Alabama, in a strong article in the *North American Review* recently, commends the utility and profitableness of the Nicaragua canal. He insists that the Government should aid this great American work. "A Government," he says, "that has given far more than \$100,000,000 to build trans-continental railroads should not fear to invest money on an assured basis of profit in order to give some of the advantages of fair competition in transportation charges to the great body of the industrial classes. Unpleasant scandals did attend the use of the money raised on the credit of the Government in the building of one of these railroads, but corruption was made possible by the absence of Governmental control in the Board of Directors. A repetition of that wrong has become impossible. Two of these railroads now owe us more than \$100,000,000, and they can and must pay the debt. That money, when it falls into the Treasury, will more than replace all that we will expend in building the Nicaragua canal if we should sink every dollar of it. It has done a great work for the people of America and of the world—a work for which we would not be willing to take any conceivable sum of money. Those railroads are our pride as a people. They are essential parts of our civilization and indispensable factors in our Government; but they are becoming too much a burden upon our internal and external commerce. Water transportation through the Isthmus of Darien is to be the efficient and just competitor for trans-continental traffic, and will add immensely to their income at lower rates of transportation, by the rapid increase of population on the Pacific slope. As we have aided great corporations by building railroads for them, let us now aid the people by building a canal that will make freights cheaper and will enrich the common treasury. If we will, we can use the money due us from the railroads to build the canal.

NATIONAL ASSOCIATION OF BUILDERS.

THE seventh annual National Convention of Master Builders held last month at St. Louis was a very successful and interesting meeting. President Ittner's annual address was full of good sense and practical suggestions. He emphasized the merits of the organization, whose objects are to bring about uniformity of practice for the common good, and to encourage friendly feeling between employer and employee. Doubtless an international organization, based on the principles of this, will soon be established.

The purpose of our American Association of Builders is to foster and protect the interests of contractors, manual laborers and others engaged in the building interests, to promote the welfare of mechanics, to disseminate literature useful for the craft, and to increase the skill of the workman by the establishment of a better apprentice system. Mr. Ittner advocated the founding of manual training schools and night trade schools for the benefit of apprentices. He spoke of J. Pierpont Morgan's gift of \$500,000 to Col. R. T. Auchmuty, of New York, the pioneer of trade schools, and said that he wrote Mr. Morgan a letter of thanks in the name of the National Association of Builders and of the American boy to whose advancement Col. Auchmuty has devoted the remainder of his days. Mr. Ittner said favorable reports were received of the trade school established by the National Association at Philadelphia, although no progress has been made in the trade school project for St. Louis. Mr. Ittner said that he hoped the day would come when no American boy would be deprived of the privilege to become a skilled workman; that there was no reason for the present discrepancy in wages between skilled and unskilled labor, and that the dearth of skilled labor today is due to the proscription of the apprentice system by labor organizations. As a man who had the benefit of an apprenticeship in two trades, Mr. Ittner expressed his sympathy for the youth who was debarred from a trade by arbitrary regulation. He looked to the trade school to remedy this state of affairs. Mr. Ittner recommended that the profit-sharing plan be considered by a committee, that fuller statistics of the building industries be taken, that more stringent building laws be enacted, and that the uniform contract system be adopted. He hoped that the relation between the architect and the builder would be always friendly and sincere. He praised the speed and skill of modern architecture, and said that during the past year the building industries have been prosperous, with a bright prospect for the coming year.

The following standing resolutions of the National Association were unanimously indorsed:

1. That manual training schools should be established as part of the public school system, and that trade night schools should be organized by the various local trade organizations for the benefit and improvement of apprentices.
2. That the Association recommends all its affiliated associations to secure, as soon as possible, the adoption of a system of payment by the hour for all labor performed other than piece work or salary work, and to obtain the co-operation of associations of workmen in the above arrangement.
3. That all blank forms of contract for building be uniform throughout the United States; that forms of contract with the conditions thereon be such as will give the builder as well as the owner the protection of his rights; that whenever a proper form has been approved by the Builders' Association, the same be used by every builder and contractor in the Union.
4. That the Legislatures of various States be petitioned

to formulate and adopt uniform lien laws, and every organization represented in the Builders' Association be requested to use its best endeavors to secure the passage of the same.

5. That architects and builder should be required to adopt more effectual safeguards in building in process of construction, so as to lessen the danger of injury to workmen and others.

6. That the Builders' Association recommend the adoption of a system of insurance against injuries by accident to workmen in the employ of builders, wherein the employee may participate in the payment of premiums for the benefit of employees. Also a system securing the payment of annuities to workmen who may become permanently disabled through injuries received by accident or the infirmities of old age.

The next convention will be held in Boston, in February, 1894.

It is calculated that the Southern States will spend about two million dollars for the representation of Southern products, in the various departments at the coming World's Fair.

Even if the foregoing amount be actually in hand, which is doubtful, the same would be scarcely adequate to give the South her proper place at this great representative International Exposition. Some of our legislatures have shown a narrow and niggardly spirit in this matter, refusing even the small appropriations asked for, and private individuals, and associations of public spirited ladies and gentlemen, must be relied upon to give these States some kind of showing at Chicago.

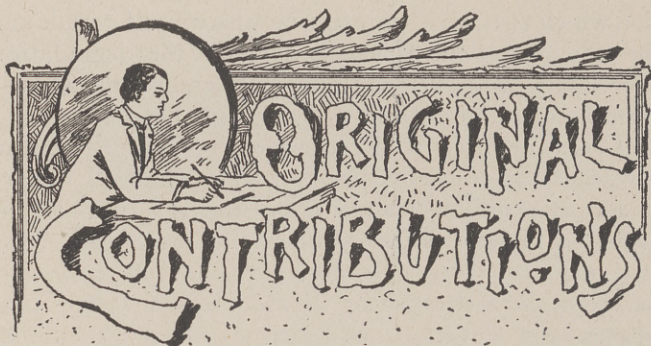
The South has never had so grand an opportunity to give the world an idea of her inexhaustible resources as she will have at Chicago, and it is the demand of common sense that she should make the most of this great opportunity. How will Georgia stand before the world at Chicago? Do our people fully realize the situation? Georgia should not bring up the rear in the world's progress.

THE Trustees of the Boston Public Library have set apart a room over the main stairs in the new building which is to be known as the "architect's room," where amongst other things of correlative interest, are to be placed memorials of those American architects of high worth to whose efforts death has put an end. It is proposed that one of these memorials shall be devoted to perpetuating the name and commemorating the life-work of the late Prof. Eugene Letang, and a committee has been appointed by the Boston Society of Architects to secure the necessary funds, decide on the character which shall be given to the memorial and take steps for its preparation.

SUPERVISING Architect Edbrooke has been in San Francisco and is only waiting for Congress to fix a limit of expenditure to begin on plans for the new postoffice. He thinks that the building can be completed in three years, and that the amount expended should be \$4,000,000.

ONE of the pleasing features of this year's exhibition of the Architectural League of New York was the display of numerous drawings for interiors, ornamental candelabras, wrought iron grilles, stained glass windows, tapestries, etc., all of which subjects are more or less intimately allied to architecture.

In 1860 we produced 60,000 tons of paper; in 1890, 1,200,000 tons or 150,000 tons more than the total product of European paper mills.



LIME MORTAR VERSUS WOOD AND GALVANIZED IRON.

THE most casual observer could not fail to have noticed of late years the increased use of plaster for exterior work, especially in residences. From making its appearance timidly in little triangles at the tops of gables, its use has gradually extended until it frequently covers the entire walls. With us this is of late an innovation, though an every-day sight in the old country. That there should be a prejudice even among the profession against the use of lime mortar as an exterior protection to walls, is not hard to account for. Most buildings that were plastered in this country were built many years ago, and much of the work it is evident was very poorly done. Those in Europe, notably buildings of the old school, show the effect of time and abuse, though perhaps not much more so than the stone work does. These, then, in the imagination are compared to the new, neat and prim looking modern frame dwelling freshly painted or stained, and the conclusion is reached that plaster is inferior to wood for exterior work or painted metal.

It goes without saying, however, that the material which experience has suggested for the protection of the walls in the old country has to a great, and in some parts universal, extent been simply lime mortar.

Practical builders will recognize two important facts concerning well made lime mortar: First, it will stick to the stone as cement will not. Secondly, it grows harder as it grows old.

Without at present considering "plaster buildings," as they are called, from the standpoint of beauty, let us look at the matter first from the point of economy. Admitting that a house built of ordinary brick and then plastered is somewhat more expensive than a frame building at the start, in the end the repairs and repairing of the frame will exceed immeasurably in expense the repairs needed for the plastered house. The coloring of the plastered work is much cheaper than the painting of woodwork, the basis of the wash being lime, and the colors of plaster far exceed in brightness and transparency the oil paints now in use. Repairs likewise, if any should be needed, are easily made.

Many architects are using wire lath over frame work as a ground for plastering on. Such a method is undoubtedly to be recommended for economy alone, but as to how durable it will prove it is perhaps too early to state. A better method, perhaps, for ordinary frame dwellings is to nail to the studs square slabs of porous brick or terra-cotta with wire nails and washers. A most durable way is to plaster directly to the brick work, which in frame houses may fill the openings between the framework in the shape of panels, or the panels themselves might be filled with concrete, which would be cheaper than the brick work, though ordinarily not as reliable.

If we now view the "plaster house" from an esthetical

point of view, and that among clients is no small consideration, we shall not fail to find a host of friends.

We think of the little white cottages of the English village, the white walls of the Alhambra, the white and painted walls of Italian palaces and villas, or the pleasant greys of many German buildings, and although we may not have been impressed as with buildings of more imposing materials, yet a charm peculiar to the material itself was not wanting which we easily recall.

For a sunny climate a prettier combination than white walls and a red tile roof surrounded by green foliage we think cannot be imagined. And as to the unworthiness of a cheaper material than cut stone or rubble, we need only refer to some of the world's most famous buildings, where all the plain surfaces are plastered, to console ourselves.

LUCIAN F. PLYMPTON.

Cincinnati, O.

A NEW METHOD OF EXCAVATING.

THE new building for the Manhattan Life Insurance Company, which is to be sixteen stories high, is to have its foundations built by a method familiar enough in bridge engineering, but rarely used in building, although we think there have been several other cases in which it has been employed. The soil in that part of New York is a fine sand, about fifty feet deep, overlying rock. It would be hazardous to put so heavy a structure on the sand, but to excavate the sand in order to carry piers down on the rock would be likely to undermine the neighboring buildings, especially as the sand is saturated with water. This difficulty is to be overcome by sinking caissons, or cylinders of steel-plate to the rock, so that the sand can be excavated from the inside of the cylinders without fear of affecting the neighboring soil. In the case of the Manhattan building, however, a modification of the ordinary system is to be introduced, about the merit of which we may be permitted to entertain some doubts. In order to enable the excavation inside the caissons to be carried on under water, they are made with a tight top like a diving-bell, and air is forced into them, so as to keep the exterior sand and water from entering while the workmen dig away the sand from the inside and under the edges. To remove it entirely, pipes are provided, through which it is forced by the atmospheric pressure. As the caissons hold a large volume of air, there might be some difficulty in sinking them to their place; so it is proposed, while the men are excavating inside, to have masons at work outside, building the stone foundation piers on the flat top of the caisson. The excavation inside the caisson is so regulated that the caisson sinks about as fast as the pier on top of it is built up, the masons thus working always above the water-line, while the caisson sinks farther and farther below it. When the caisson reaches the rock, the workmen inside level the rock, so as to give it a firm bearing, and then to fill it with concrete, which, we are told, is to be "carefully packed," so that the space from the rock to the roof of the caisson may be solidly filled, and the whole is left in place, the building thus standing on cylinders of steel-plate filled with concrete, surmounted by piers of stone and brick.—*American Architect.*

THE new Mormon Temple will be dedicated at Salt Lake, April 6. The construction of the building was begun forty years ago, and it has cost \$2,500,000.

A superior quality of asphaltum has been discovered near Homer, Ky.



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Committee upon Conservation of Public Buildings: Richard Upjohn, Chairman, New York, N. Y.; Presidents of Chapters.

Committee on Competition Code: Charles F. Illsley, Chairman, St. Louis, Mo.
Place of next Convention, Chicago, August, 1893.

POINTERS FOR ARCHITECTS.

THAT there has been a marked improvement in architectural design in this country during the past few years, says the *Architectural Era*, must be evident to the most careless observer, and it is the more gratifying that this advance is not confined to any particular part of the country, but is seen everywhere one goes. To the trained architect, however, during his holiday wanderings especially, when he has more leisure to take note of his surroundings and reduce to order his impressions of them, there is continually present a regret that a careful study of the principles of design is not more general, in order that the grave errors in composition which one so often meets with, and which so seriously mar otherwise meritorious work, might be avoided.

The most serious and well-nigh universal defect is an absence of refinement, both in mass and detail, and a lack of restraint and evident disregard of the value of temperance as an architectural virtue. Command of material, ingenuity in meeting difficulties, readiness in the solution of new problems, are everywhere evident; but there seems to be a lamentable lack of that artistic percep-

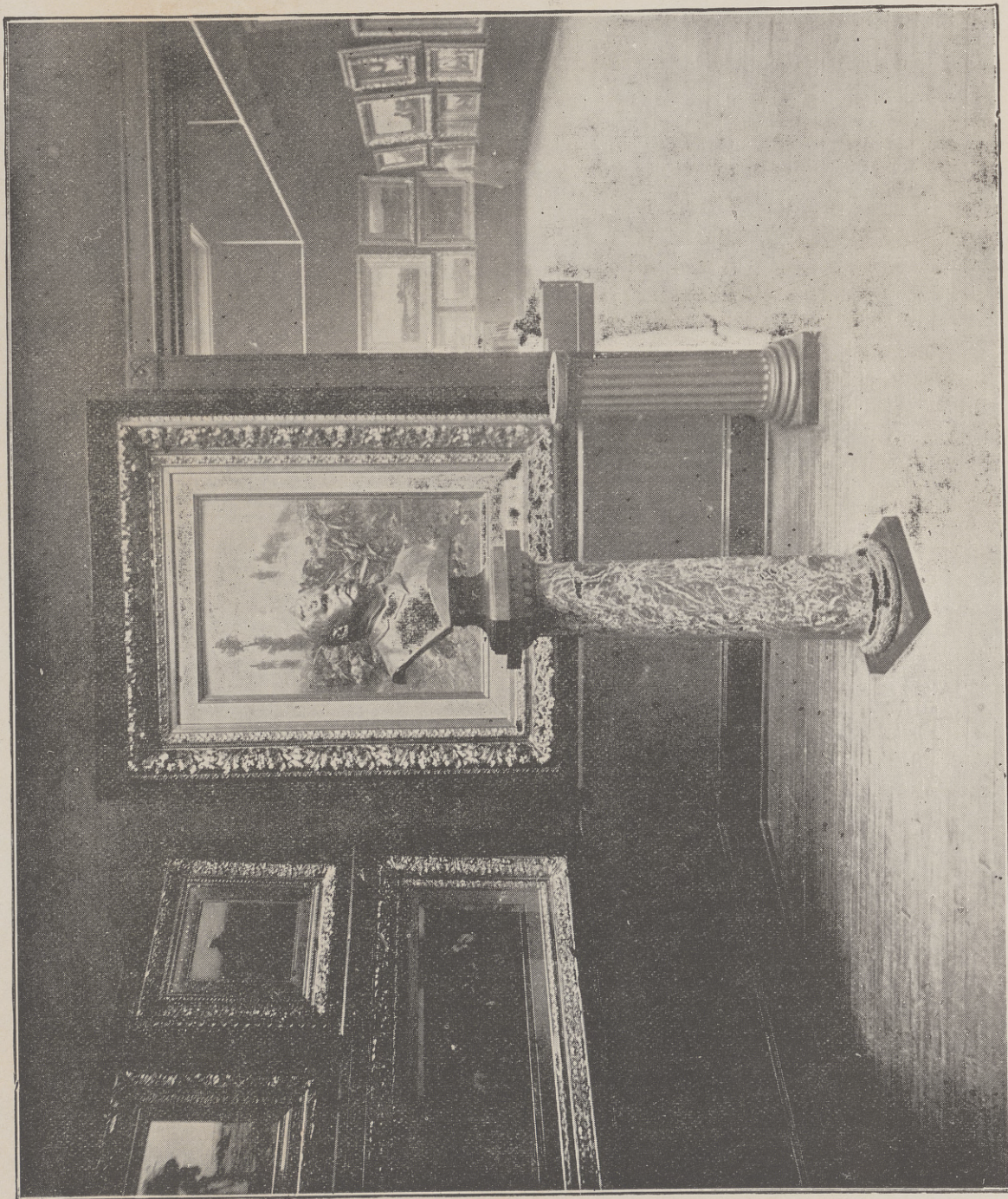
tion which distinguishes intuitively between the crude and the refined, and one especially laments the degradation of so many compositions through the indiscriminate use of ornament, and disorderly arrangement of the mass.

If every architect who is conscious of an indecision in his general methods of composition, or who feels in particular cases an uncertainty as to the best solution of the problems in hand, were to make a resolution that for a twelvemonth every new design should be rigorously balanced and restrained by an absolute symmetry, both in plan and elevation; and that expression should be made to depend on arrangement of the mass in gross rather than on any characteristics or disposition of the ornament; and if to this were added a determination to use "detail" less profusely, reserving it for the more important centers of interest in the composition, and using it there judiciously, and making it as delicate and refined as possible, an immediate and profound change for the better would result, and one that would be quite as much appreciated and understood by the general public as by the profession.

We make this suggestion, not because symmetry is an indispensable factor in every successful composition, nor because ornament is not sometimes to be used profusely—for neither proposition would be true—but because the discipline which would result from working within these self-imposed limitations would give to the artist renewed interest and pleasure in his own work, and leave him at the end of the period with a sense of artistic power which would prove of the highest importance to him in his professional advancement. Members of the profession who have had the benefit of school training either at home or abroad do not need any such hints. They already know the value of the discipline and restraint imposed and cultivated by a course of academic training; but there is a large number of architects who are doing good work and capable of doing better, who lack the direction toward, though they feel the need of, a systematic method of composition, and it is to them we have ventured to make this appeal. There are of course some special cases in which symmetry cannot be had owing to peculiarities of site, but there are few problems to which it is not to be applied, and fewer still which will not be the better for it. A striving for simplicity in all cases where it is suitable, and temperance everywhere in the modeling of mass and detail (including the use of color) would avoid most of the errors which disfigure a great deal of our current work, and detract from the merits of much that is otherwise of the highest promise and merit.

A NOVELTY in the hatching of eggs has appeared in the way of an electric incubator. The special feature of this machine is that the heat of the egg drawer is automatically regulated to the fiftieth part of a degree Fahrenheit. It consists of a tank incubator, heated by radiation from the bottom of a water tank, which is constructed on the multitubular system. When the egg drawer reaches the temperature of 140° F., an electric thermostat connects a dry battery with an electromagnet, which actuates a damper, allowing the heat to escape through the open air instead of passing through the flues of the water tank. This entirely automatic device is said to effect a saving of 30 per cent. in the fuel used for heating.

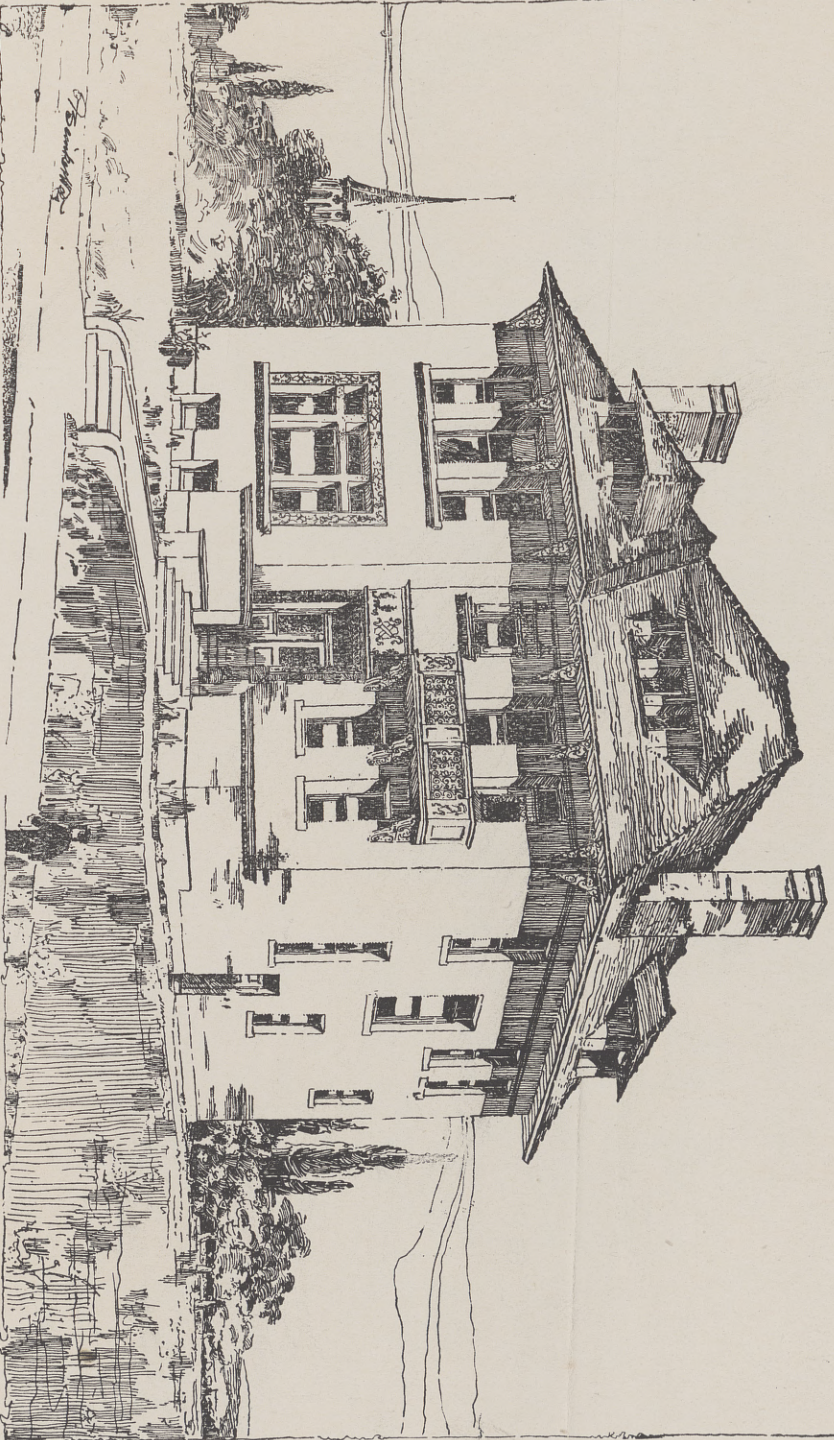
In an economic and sanitary sense it would seem that some of our modern architects and builders, in breaking away from the old custom of enclosing service pipe in hollow walls, are making a move in the right direction

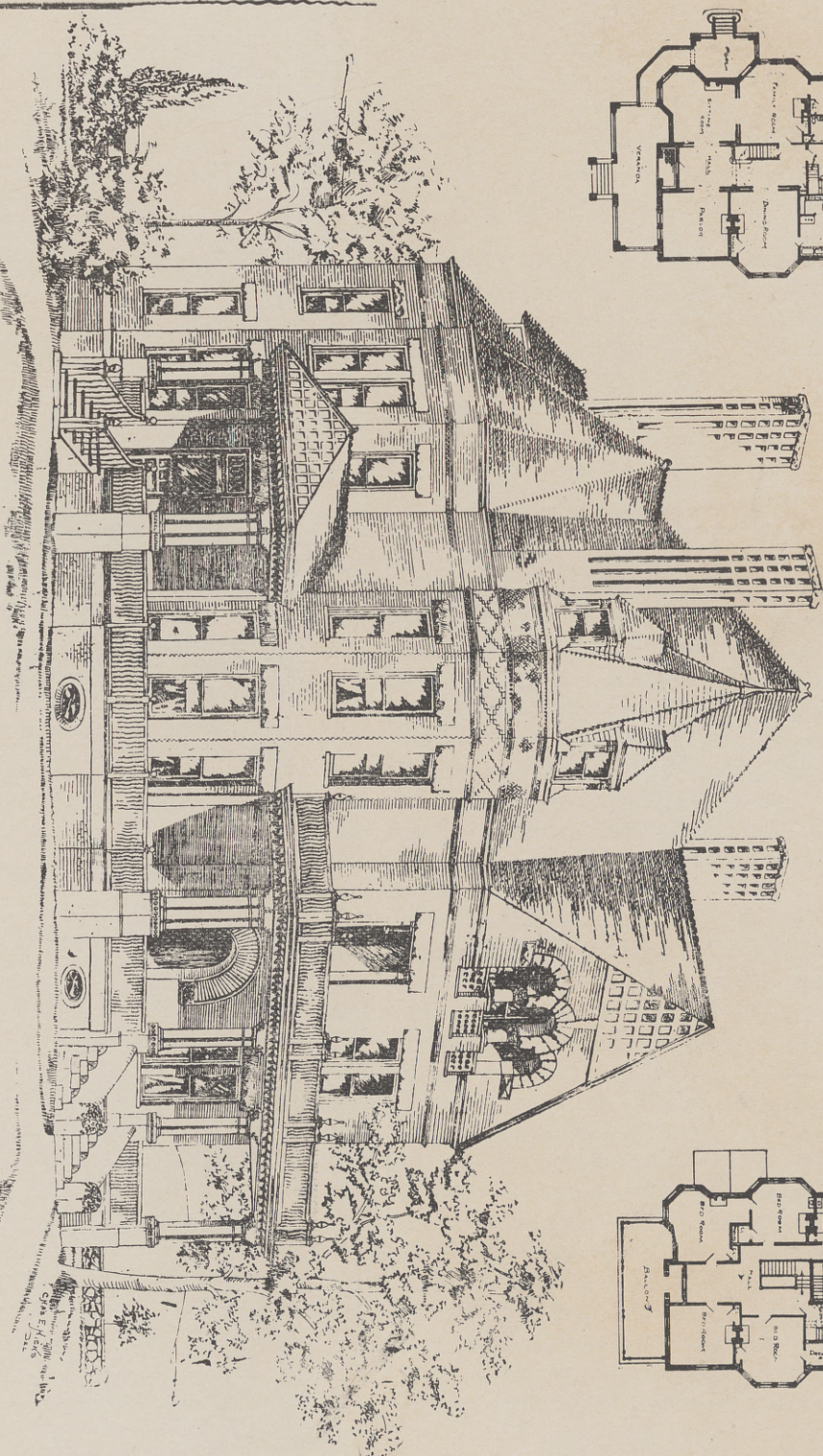
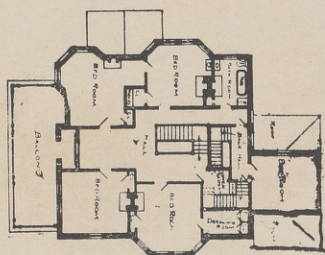
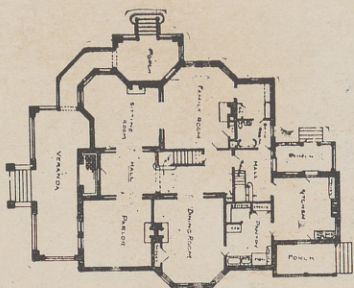


Vol. IV.—Southern Architect.—No. 5.

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THE SOUTHERN ARCHITECT.

We shall be pleased to receive from architects, engineers, builders, and others articles treating on matters of interest to architects and the building trades.



In order to make this journal a true representative of Southern architecture, we will be glad to receive from architects and draughtsmen designs of buildings for illustration in these pages.

Bust of J. W. Root.—Chicago, Ill.

Residence of M. L. Ross.—Bauman Bros., architects, Knoxville, Tenn.

Residence of Mrs. Laumeyer.—Beinke & Wees, architects, St. Louis, Mo.

BURNED CLAY AS ROOFING MATERIAL.

At the recent National Convention of Bricklayers in Louisville, Mr. J. R. Elder, of Indianapolis, read the following interesting paper on burned clay as a roofing material:

Under the head of burned clay as a roofing material the word "tile" expresses the material it is made of, how made and its uses. The Century Dictionary defines the word tile as a thin slab of baked clay used for covering roofs. Iron or other metal is not tile, nor is anything else other than burned clay.

Edward L. Morse published a series of articles in the *American Architect* in 1893, on the older form of roofing tiles that are exhaustive in tracing their history. He traces their use back to China several thousand years before Christ, and says they were made even before the sloping roof was first used. Palm leaves, straw and the bark of trees formed the first coverings for slooping roofs, and then comes terra-cotta tile made in the form of bark, with the larger pieces curving upward and smaller pieces to cover the joints. It is a remarkable fact that tiles are made and used in this country to-day of the same general form that were used 4,000 years ago.

In his classification Mr. Morse shows that the normal (Asiatic) tile was used in the Orient, ancient Greece and Italy, China, India, Greece and Italy; the pan (Belgic) in England, Scandinavia, Belgium, Holland, Japan, Java and various modern countries; the flat (Germanic) in Germany, Austria, Hungary, Poland, Switzerland, France and England.

In the shape and form of these tiles may be seen the same shapes and forms generally used to-day in Europe and America. The most artistic tiles are found in China, Corea and Japan, where they are highly glazed in different colors, with very elaborate finishings, making a very showy and ornamental roof.

A. Rospide has an article in the Encyclopedia of Architecture and Construction in which he divides roofing material into four parts—first, clay; second, stone; third, metallic, and fourth, wood, giving the preference in the order named. He says the following are requisites of every good roofing material:

1. It must exclude moisture, which rots wooden frame-work.
2. It must be capable of withstanding the force of the wind, and must admit of provision for all expansion and contraction consequent upon variations in temperature.
3. It must not overweight the trussing so as to increase the size of the supporting timbers.
4. It must be fire-proof.
5. The original expense should be consistent with the purpose which the construction is to serve.
6. It should require but little care.

Other architects have spoken as favorably of tiles in preference to all other forms of roofing.

Architects and others often wonder why more tile has not been used in the United States. The question is very easily answered. In the first place, this is a timber country. Clapboards and shingles were easily made and formed a cheap roof that answered the purpose for a time. Then came slate and tin and galvanized iron and felt and gravel, that could always be obtained when wanted, and were light and cheap. Tile, as made, was heavy, expensive, hard to get, and in consequence was only used on expensive buildings that could contract for it in ample time.

So far as I have been able to learn there are only five tile works in the United States. Three of these are in Baltimore and two in Ohio. Terra-cotta works have made tile on orders, but it is a branch they have not prepared for and only make when they feel compelled to. There is more tile made by one factory in Ohio than by all the balance in the United States. This fact would indicate that making roofing tile has not been profitable in this country, and this is probably true, as we find where any business is successful competition starts up all around it. In our opinion the reason the tile business has not been more successful is because the old form of tile and the way of making it in the old country has been followed in this. The tile is too heavy, has to be laid in cement, and the improved machinery has not been used in making it. And again, stocks have never been kept on hand to fill orders on short notice. When you think of the vast sums that are spent each year in buildings, and that fully one-twentieth of the cost of all these buildings are for the roofs, you can see what a business can be done if the tile can be had at a reasonable price.

In speaking of the tile factories above I did not include four that have been started within the last year to make tile under the patents of the Clay Shingle Co. One factory has been started at Baltimore, one at Trenton, N. J., one at Chicago and one at Denver. Before this year is out all these factories will be making tile on

a large scale, and negotiations are now pending for several other factories.

In considering the value of roofing tile the question of protection from fire and insurance enters largely into the account. In these days, when so much money is spent in fire-proofing the inside of buildings with hollow brick walls, deadening the floor with terra-cotta blocks and steel joists and girders, it seems like folly to put material on a roof, the most exposed part of the building, that will not resist the least heat, but rather attracts fire from adjoining buildings, and often when more than a square away. Many of you have had fires, and know what it means to be burned out; and all of you pay insurance, and know what a heavy tax that is. In Germany, where buildings are constructed under government inspection, with all possible protection against fire, and where tile roofs are universal, the rate of insurance is one-tenth of what it is in this country. A risk that will cost one dollar there will cost ten dollars here, and losses by fire there are as one to one hundred here. In the last seventeen years in the United States the losses by fire were \$1,818,323,306 more than the present national debt. In the year 1891 the loss was \$143,764,967 in 23,313 fires. Of these fires 981 were caused by sparks from locomotives and flues, on which the loss was \$4,506,184. There were 12,394 business failures traced directly to the loss by fire in 1891. Last year \$40,600,000 of property was destroyed by fire that did not originate on the premises or by exposure to adjoining property. The percentage of loss in 1891 that originated on the premises was 71 8-10, and by exposure 28 2-10. This is a fearful record of loss by fire, and the worst of it is every one has to pay part of it, whether his property was insured or not. This is only the money value of the loss, and if the loss in time and business by men thrown out of work was estimated, it would probably be more than double. Now, as it is an admitted and unquestioned fact that there is no material that affords as certain a protection from fire as burned clay, you see the value tile has for roofing. Nearly one-third the fires and one-third the loss in 1891 were from outside exposure that might and would have been saved if the building had been covered with tile. Can any stronger argument be used in favor of covering houses with tile?

Another valuable quality in the clay roof covering is that it is a non-conductor. Now it is as important in building a house to keep out the heat in summer as to keep it in in winter. It is the rule that the attics of our houses, and especially if covered with slate, are as hot as ovens, and as long as a single floor and coat of plaster only separate the attic from the sleeping room, the temperature in the latter nearly equals that of the former. Nothing so effectually overcomes this as a tile roof, which neither attracts the heat nor retains the frost. The sleeping rooms in a house covered with tile are always comfortable—cooler in summer and warmer in winter.

STEEL CEILINGS.

To meet the requirements of the age in interior decorations every effort is being put forth to secure something that will afford the decorator an opportunity to enrich and beautify and at the same time prove substantial and permanent. As a result of these efforts astonishing progress has been made within the last few years in every class of standard material, not only in the quality, but in the application as well.

New materials have been brought into use, and the most prominent of these are metal ceilings, and wall coverings. Steel, the most intractable of all metals for interior

work, has at last been made to subserve the architect and decorator in carrying out architectural and artistic effects, and is steadily growing in favor among architects and builders. The evolution of metal ceilings from the old-fashioned corrugated or crimped ceiling to the present ceilings of beautifully designed panel work, so constructed that neither points nor fastenings are visible, has been slow, and the present degree of perfection has only been attained by the untiring application of men of remarkable mechanical ingenuity, who have devoted years of labor and study to bring this metal under subjection.

Mr. W. R. Kinnear, of Columbus, Ohio, who has in all ways given his work thorough attention and brought it as near to perfection as any other manufacturer in the world, in discussing this subject recently, stated: "That the present tendency among the architects who are most familiar with the latest improvements in the manufacture of metal ceilings and their construction is not to treat the metal so as to imitate some other material, as wood or plaster, for example, but to have it possess an individuality of its own, and to carry with it unmistakable evidence that it is metal and therefore substantial." From the fact that every year iron and steel enter more largely into building construction, it is but natural that every kind of metal work should receive a closer inspection, and where found practical, used and recommended.

The generally accepted idea of a majority of the people is that metal ceilings and wall coverings cannot be so made and constructed as not to show unsightly seams and joints. This idea, fostered largely by those whose business interests lie in the use of other materials, is too often confirmed by their examination of indifferent pieces of work, in ordinary corrugated or crimped iron divided into squares by cheap iron or wooden molding and so-called panel work. The impression thus obtained is hard to eradicate, and with but one or two manufacturers of metal ceilings that meet the demands for first-class work, engaged in disseminating information concerning this subject, the education of the people in general is necessarily slow.

The advantages of metal ceilings over any other, when they can be made to conform to the demands of architects and designers, will be readily understood, as their character protects them from the destroying agencies that ruin the most expensive ceilings in other materials. First, they are not injured by water or dampness. Second, they improve the acoustic qualities of rooms, as they break the ceiling up into an uneven surface, deflecting and carrying the sound forward without absorbing it. Third, they will not absorb odors or harbor disease germs, and are of great value where the best sanitary conditions are a necessity. Fourth, they are fire-proof to a large degree, as the joints are so close that there is practically no circulation of air between the metal and joists; hence the furring and joists simply char under intense heat; and give better opportunity to confine it to the room in which it originates.

In many instances these ceilings have proved their value in cases of fire, and when the facts concerning their usefulness in this direction become well known the demand for this work will, no doubt, be greatly increased as it will become an important factor in large buildings, which as now built are not of strictly fire-proof construction.

A Welshman has devised a new process of giving a uniform coating to tin plates. Instead of employing rollers the plates are put in racks above the pot of coating metal, in which they are inserted and from which they are withdrawn at a uniform rate.

WHAT CONSTITUTES AN ARCHITECT.

EXTRACT FROM AN ADDRESS BEFORE THE SOUTH AUSTRALIAN INSTITUTE OF ARCHITECTS, BY H. C. RICHARDSON.

I THINK you will agree with me in saying that the public generally recognize two classes of architects, and although probably in the majority of cases they (the building public) would not be able clearly to define the exact qualification of each class, yet in the main the public opinion is founded in fact. For the purposes of this paper I will define them as the practical and the artistic architect. It appears to me that the majority of architects in the colonies come under the title of practical, inasmuch as they have graduated in the workshop or in one or more of the main branches of the building trades, and most likely have been good sound tradesmen in their own particular branch, and as the whole of the branches of the building trade necessarily dovetail into each other, they know something of every other branch besides being expert in their own particular one, who by patient study and industry have raised themselves, if I may so designate it, into a higher plane, viz., that of an architect. Now my experience leads me to conclude that the building public generally prefer the practical man rather than the artistic, and this preference is mainly based on the supposition that the man who has the reputation of being a good mechanic in some branch of the building trade is necessarily the best to secure a sound and substantial building. Now admitting for the present that this supposition is correct as a first and fundamental qualification for a practical architect, what other qualifications ought he to possess in order to complete his title to the position? First, then he should be able to draw a plain plan so that it will be understood by the builders or workmen; then he should be able to estimate the value of all the works intended to be constructed, at any rate within a margin of ten per cent. of actual cost when completed; he should have some general knowledge of the nature of the ground on which he is about to build; he must know the usual stock sizes of timber or other materials, and thickness of walls, and the general recognized methods of construction among the various branches of the building trade; in tracing his plans he must be able to comply with the Building Act so as to pass the surveyor; and in writing his specification and stating the sizes and quantities of the principal materials he intends to be used, it is only necessary for him to state that the whole of the work is to be executed in a first-class manner to the satisfaction of the architect, and that the contractor must comply with all the regulations in connection with Corporation Acts, Building Acts, Waterworks Acts, Sewer Acts and Gas Companies—regulations which saddle all the responsibility as to the soundness of these works on the inspectors appointed under the several acts of Parliament. These are about all the qualifications necessary to entitle one to the name of a practical architect and enable him to obtain his livelihood at his profession in the beginning of his career, unless, indeed, we add another very important faculty in the estimation of some clients, viz.: that of obtaining the maximum amount of work at the minimum of cost. The practical architect mostly commences his career from the bench or the trowel, and begins with a job or two and in the course of a few years experience he gradually becomes or develops by gaining a knowledge of the principal requirements of most business premises, such as factories, warehouses, breweries, shops, etc. So far as my reading of history serves me, I have arrived at the conclusion that the profession of the practical architect of to-day is a very modern institution indeed, the outgrowth

of the commercial and intense money making spirit of the times in which we live, for in ancient and mediæval times the duties of a practical architect were merged in the trade guilds which then existed, and under those conditions he would only have been rated as a superior clerk of works.

It is quite a common practice for writers and lecturers, on architecture and architects, to bewail the deterioration of art as exemplified in the architecture of modern times, and no doubt it is perfectly true that the best of modern buildings sink into insignificance when compared with those of ancient and mediæval times. But they put the blame on the wrong shoulders when they attempt to make the architect responsible for this result. As an example of this kind of writing, I will refer you to "Rosengarten Styles of Architecture." He says: "In Baden the architects Hübsch and Eisenlohar, who exercised a certain influence both as teachers and practical artists, instead of making the stylistic and æsthetic form of the building their study, the school distinguished itself by inscribing on its banner strict utilitarianism as its rule." And in another place he says: "Even in the case of many architects of the present day, much still remains to be desired. In their efforts to produce something novel they borrow some detail of style—especially the Romanesque—which they introduce in an inappropriate manner or in an unsuitable position, thinking in this way to exhibit to their townsmen something that may prove startling by its boldness and novelty." Also I see that Mr. John Sulman, F.R.I.B.A., in his address as President of Section J, at the meeting of the Australian Association for the advancement of Science, held in New Zealand, seems to have a similar opinion, as he complains of the sameness and uniformity of appearance in the houses, offices and shops of modern towns, and says "that they all look as if they had been cast in two or three stock patterns and then cut off in lengths as required." But, as I said before, instead of the architects being made responsible for this state of things, the fault, if any, belongs to the whole community.

Now, the qualifications necessary to entitle one to pose as an artistic architect are altogether different to the practical. From the former's point of view a building is a structure that ought to be treated entirely as a work of art; therefore it is necessary that he should have had an education in the highest schools of art; studying the great masters and their works, both ancient and modern. He must be thoroughly acquainted with all the styles of architecture, so that he may be able to design not only the buildings themselves but also the furniture, wall decorations, and all the internal decorations of a residence, palace, cathedral, or conservatory. He needs to be well educated in all the principles of design and the science of colors; in fact, he requires to have an acquaintance with every convenience and luxury of modern life, to enable him to design every part of a building and fittings so that when it is complete it shall have a pleasing and artistic appearance. He should also be an accomplished draughtsman in every branch, and if he possess these qualifications, with the practical qualifications before mentioned, he may fairly consider himself a good all-around architect. But, whatever may be the qualifications of an architect, under our system of tendering for works, he will always find it difficult to fulfill all the duties which his profession demands, for, when once a contract is signed by both parties, he is then only the agent of the employer who pays him, and although honor and justice demand that he shall act fairly between the employer and contractor (and, in most cases, architects faithfully fulfill their trust), still the suggestion is that if there is any doubt he will give the benefit of it to the em-

ployer, and the consequence is that he is, to a great extent, looked upon by the contractor and workman as a task-master who is bound to extract from them the last farthing or traditional pound of flesh for the benefit of the employer. In the case of unprincipled contractors or workmen they are apt to take advantage of his ignorance or want of watchfulness in order to avoid fulfilling their part of the contract. Now, I do not believe that the ancients could possibly have carried the building art to such perfection as the ruins of their works testify to-day unless they had ideal architects and the very best of workmen, and all working under ideal conditions such as are not present in the civilized world to-day; they certainly were never carried out by contract, neither do I believe that they were executed by slaves, nor by virtue of onions, radishes and garlic.

To complete this paper I may state my conception of an ideal architect: he must possess the highest kind of natural abilities, and be afforded every facility for exercising and enlarging them from his childhood to manhood; he must have a robust constitution, fitting him for laborious research and study so as to enable him to obtain a complete knowledge of the physical and mathematical sciences; he must be an enthusiast in art, and above all, he must possess a permanent income of such amount as to render him independent of his profession for the purpose of earning his livelihood. Added to this, he ought to have a practical qualification besides, and be backed up by wealthy patronage. But I suppose such an architect does not exist, or if he does, the conditions of society are such that his abilities cannot be utilized. And I think that Professor Bax, in his lecture on the revolution of the nineteenth century, gives the sum and substance of the whole matter, as touching art and architecture and architects, when he says: "A volume might be written on the artistic contradictions of the present age, which are the direct results of the religious and economic contradictions: art is degraded to furniture; quantity takes the place of quality in artistic production, simply because art is dominated by capital, and artists impregnated with the gospel of commerce. The true artist is also impregnated with the lack of the ideal he sees around him; with the contradiction between theory and practice; between what is recognized and what is really believed."—*Building and Engineering Journal*.

DAK may be given the appearance of age by sponging with sulphuric acid and water equal parts, or what is preferable, staining with umber in thin shellac varnish. Iron work may be treated with a wash of sulphate and heating over a fire, or by brushing a solution of flour of sulphur in ten parts of turpentine, dissolved by heating over the irons, then holding them over an alcohol lamp; heat until the black polish appears.

IT is said the wood on the north side of a tree will not warp as much as that from the south side; and that if trees are sawed in planes that run east and west as the tree stood, it will warp less than if cut in the opposite direction. However this may be, it is certain that the tendency to warp when sawed into boards is much greater in green than in dry wood, and that the convex side of the curve is always toward the heart. This warping, due to unequal shrinkage, and to the more open texture of the tree, is not found to occur in the middle plank or board of the log, excepting as it may, in slight degree, reduce the breadth.

A NEW paper mill is being erected at Buena Vista, Va. This company will make high grade bleached chemical fibre, suitable for writing and fine book paper:

THE WHITE HOUSE.

THE CORNER-STONE LAID OVER A CENTURY AGO—IT HAS COST OVER \$2,000,000.

IT is said that the White House at Washington has cost \$2,332,000 down to the present time. To start with, the State of Virginia contributed \$120,000 and the State of Maryland \$72,000 to build it. A prize of \$500 had been offered for the finest design, and this was awarded to a young Charleston Irishman named James Hoban, who followed closely the Duke of Leinster's palace at Dublin. The plan contemplated a three-story building, but Congress refused to appropriate the money for anything so extravagant, and the district commissioners cut down the design to one for two stories and a basement, with a length of 170 and a depth of 68 feet.

Washington finally induced Congress to add to the sums contributed by Maryland and Virginia, enough to finish the work of construction. The corner-stone was laid in the presence of President Washington October 13, 1792, and President John Adams took his family into it in November, 1800, though Mrs. Adams complained of the discomforts to which she was subjected in its unfinished condition. Congress had appropriated \$15,000 to furnish the building, but its expenditure was strung along for four years.

At the beginning of the first administration of Jefferson and each of the administrations of Madison, \$14,000 was appropriated, but in 1814, at the taking of Washington, the mansion was burned by the British soldiers. A heavy rain saved it from entire destruction, and in 1817 \$20,000 was expended in its reconstruction. The red sandstone was painted white to remove the traces of the fire, and the building has since been known as the White House in consequence.

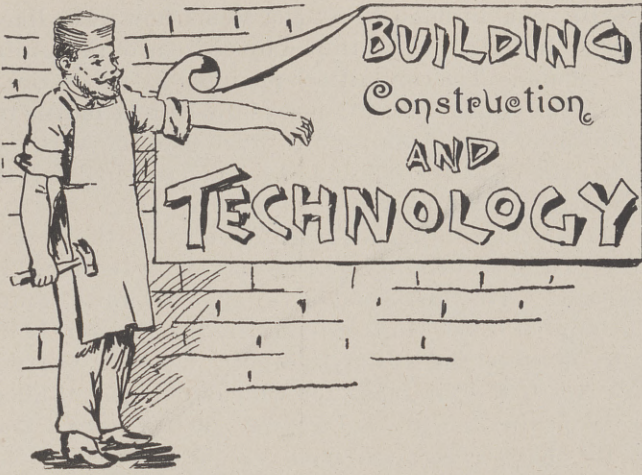
In Jackson's first term the front Ionic portico was added at a cost of \$19,000, and when Harrison came in the foreign mahogany furniture was replaced with American at a cost of \$6,000. During Lincoln's first term \$29,000 was laid out in repairs. In 1865 the house was thoroughly overhauled and refurnished at an expense of \$76,000, and two years later \$59,000 was spent for similar purposes. In Grant's first term \$135,000 and in his second \$110,000 was spent; in Hayes' \$90,000, and during the Garfield-Arthur administration \$110,000.

In the last mentioned sum is included the cost of refitting the mansion with modern conveniences and substituting a jeweled glass screen in the vestibule for a former wooden partition. During Cleveland's term there was an expenditure of \$74,000, and during Harrison's one of \$96,000, the average annual outlay of recent years having been \$25,000.

The President's family has at its disposal five bedrooms, a dining-room, a sitting-room and the red room for a parlor; the east room, the green room, the blue room and the state dining-room being reserved by tradition for public purposes. Mrs. Harrison urged that wings should be added to the building for the comfort of her successors. It has also been proposed that another building should be erected near at hand for the President's family, and that the White House should be given up to official use.

THE largest window glass factory in the United States has been located at Alexandria, Ind. The new company is said to represent nearly \$5,000,000 in capital. This plant will give employment to about 500 hands.

A MATCH-MAKING machine is an automatic curiosity. It cuts 10,000 sticks a day, and then arranges them over a vat, where the heads are put on.



THE ARCHITECT AS ARBITRATOR.

THE almost universal custom prevailing in this country for some years, of making the architect and superintendent of a building the arbitrator on all questions of difference arising under the terms of the contract during the execution of the work, is being gradually done away with, and the question naturally suggests itself is it best to change this general manner of doing business after it has become a well established custom. Contractors, as a general rule, have of late rebelled considerably when asked to sign contracts making the architect the sole umpire and judge. Our experience is that with honorable architects the custom is a good one, although the authority given is often abused in the interest of the owner, as against the contractor. Whether this be so or not, contractors look upon this portion of a contract with suspicion unless the architect is well known for integrity and honesty of purpose. So much has this matter been discussed in various ways that building associations generally condemn the practice, and have gone so far as to prepare a form of contract in which any questions of difference arising during the execution of the work are to be settled by an arbitration committee, thus taking the authority entirely out of the hands of the architect.

We do not know whether architects are particularly fitted by education or experience to distinguish the legality of questions which more or less touch upon the law of contracts as laid down in our statute books. But there are matters in connection with the carrying out of a building which only the architect should decide upon, and it is a serious question whether the interpretation of a design should be left to inexperienced judges of building, however expert they may be on questions of law.

Take for instance the matter of "extras," which are often a large item in the construction of a building. The owner changes his mind regarding the plan of construction, and hence believes he may be benefited by additions which he requests his architect to make. When made the architect, acting as the superintendent and the agent of the owner, directs the contractor to execute the additional work. Now, if the contractor would proceed, as almost any business man should—that is, make a distinct bargain for the extra work, and have the items indorsed on his contract, questions of arbitration would be few and far between; but in nine cases out of ten this is not the case. Extra work is performed with the tacit understanding that in the end some sort of an amicable settlement can be made. In a very long experience with matters of this character, and as a general proposition, we have yet to find the contractor who made out a low bill of charges for "extras," or an owner who did not think them exorbitant, hence the arbitrator finds two

important opposites to reconcile. Either the contractor must be convinced that his charge is too high, or the owner that he is not capable of judging in matters of this character.

It may be an exceedingly easy matter for the architect who is familiar with all of the circumstances surrounding work of this nature to decide very nearly what is a fair price, but what shall we say of a committee of arbitrators who know nothing of the case, and must base their final decision on the testimony (often conflicting) of the parties to the controversy? There must clearly be many instances of this character in which the architect is the proper arbitrator.

The sweeping clause in some of the new forms of building contracts, indorsed by the building fraternity at large, and particularly the National Association, will be found to work more injury in the outcome to the builder than the old custom of leaving all questions and matters to the judgment and the decision of the architect. In all matters of law some one must be the judge, and we know of no reason why contractors as a class should not be willing to trust one of their fraternity, for the fact is, an architect is but a builder, with perhaps a larger experience in matters of law than he who works only with his hands. It may perhaps be sound law and good advice that a builder should not sign a contract with a clause to the effect that any dispute or difference arising between owner and contractors as to materials or execution are to be settled by the architect, whose decision on all matters appertaining to the contract shall be final and conclusive; and yet the conditions and relations which exist between owner, architect and builder are so peculiar that it may be in many cases the very best thing a contractor can do to enter into a contract of this nature.

There is no law forcing him to sign a contract with the clause inserted, hence if he is not at the outset willing to appoint the architect his arbitrator he should not sign it. In fact, we believe it better to settle the question of arbitrator on the part of both parties before entering into the contract, for then each party may know what to expect if questions arise between them liable to a difference in opinion. We believe that the selection of an arbitrator after the dispute has become a fact, and the delay and cost of entering into a formal arbitration, does not give the builder as good results as the old way sought to be set aside.

If, by a discussion of the matters connected with the misunderstandings growing out of the building business we may be the better enabled to finally establish some procedure in the practice of which we do away with vexatious questions, we shall serve the double purpose of saving the builder a large percentage of his hard-earned wages and the courts a very important portion of their business. At the same time we may be enabled to bring about an understanding between the architect and contractor which we deem of the greatest importance to the fraternity at large, to say nothing of the interest which every owner has in matters of this nature.—*The National Builder*.

A CHAIN made for the United States Government at Troy, N. Y., in 1883 was six miles and a fraction in length. It was made of bars of iron each $2\frac{1}{2}$ inches in diameter.

A NEW copper mine has been discovered within two miles of Bentonville, Va., and within about twelve miles of Front Royal. The veins run from 15 to 20 feet in thickness.

THE Niagara suspension bridge was opened in 1869.

DANGEROUS CHIMNEY FLUES.

ILL-CONSTRUCTED and dilapidated chimney flues, pertinently says the New Orleans *Picayune*, must be credited with not a few of the fires that have marked the prevalence of cold weather in this city and other parts of the South recently. The frosty nip caused the building of fires in many an unaccustomed room, and so old and ruinous chimneys, whose interior plastering has fallen, exposing crevices and crannies calculated to lead heat and flame to ancient and dry woodwork in the construction of houses, have become most dangerous factors in the causes of conflagration.

There appears to be no remedy so far as houses already built are concerned, but one can be applied to all new constructions by requiring special conditions to attach to the making of chimneys and smoke flues. In many cities it is expressly forbidden to plaster or parget the interiors of such flues, but they must be built with close filled mortar joints or they may be lined with metal or fire-clay pottery under specified conditions. The New York city building law is very strict in these matters. It provides that all flues for house heaters, bake ovens, large cooking ranges, laundry stoves, etc., shall have 8-inch struck-joint brick flues, or if an approved burnt clay or metallic well-jointed lining is preferred, then a 4-inch wall well bonded and having a clear air space of one inch between will be allowed. For fireplaces and small stove flues the air space may be omitted. The backs of fireplaces must have eight inches of brick backing. No pargeting will be allowed in any heated flue. Steam boilers, smelting furnaces and other high heat flues must have double walls with an air space between. The 4-inch linings of the first twenty-five feet is to be made of fire brick. All flues are to be carried at least three feet above the roof and capped with cast iron, terra-cotta or stone. Cupola stacks must be at least ten feet higher than any building within fifty feet.

Flues so built would not be liable to become dangerous with age and neglect, because there is no plastering to fall off and leave open joints. The joints between the bricks being filled with mortar can never gape or come open, unless such a mishap is caused by the sinking of the foundations of the building. But chimneys which are plastered inside are constantly subject to be made dangerous by the falling of the plaster. Fortunately the infrequency with which many old flues are used is a great security against what would be a constant risk in climates where fires during the entire winter are necessary to make houses habitable.

ELECTRIC push buttons should be clearly visible on the front door, and the more conspicuous they can be made without offending good taste the better. The practice of placing such push buttons in some obscure place, hidden in the shadows of the moulding of the door jamb, where they can neither be seen nor found in the dark, is a poor one, causing much annoyance which might quite easily be avoided. The first purpose of a push button is to be useful and this purpose is best served when it is plainly visible and accessible to those desiring to enter the house.

THE canal through Nicaragua seems now quite likely to be built and controlled by citizens of the United States. The committee appointed by the National Nicaragua Canal Convention says the cost including the payment of interest during the progress of the work will be less than \$100,000,000 and the time required for the completion of the work is less than five years.

The route for shipments from Western North America and Australia to Europe will be materially shortened by the canal. The Suez canal saves only 3,600 miles around the Cape of Good Hope as compared with over 10,000 miles saved by the Nicaragua canal. The tonnage tributary now to the Nicaragua and which would pass through at its opening is computed at over 6,000,000 tons a year. At the charge of \$2 a ton made by the Suez canal this would make an income in tolls of \$12,000,000 a year. As the cost of operation and maintenance is placed at less than \$1,000,000, the net income would be \$11,000,000. The committee is confident that in less than five years the income would be over \$20,000,000.

Of the entire distance of 169½ miles from the Atlantic to the Pacific Ocean through Nicaragua only 26¾ miles will have to be excavated. The other 142¾ miles consists of Lake Nicaragua, the San Juan river and depressions in the surface of the earth. Lake Nicaragua will constitute a harbor 110 miles long, 60 miles wide, and the water is 250 feet deep at its deepest point. Vessels entering the canal from the Atlantic Ocean will sail on a level with the ocean for 12¾ miles, and then be raised by three locks to the level of the lake. They will sail along on the San Juan and the lake, on the lake level, to within three miles of the Pacific coast, where they will be lowered by three locks to the level of the Pacific Ocean.

The distance saved to navigation by the canal between New Orleans and San Francisco for instance, will be 11,853 miles.

All surveys and examination of strata requiring removal have been completed. The jetty has been constructed and the harbor of Greytown has been restored so that vessels of fourteen feet draft have an easy entrance. Extensive wharves, landing places and permanent buildings have been constructed, temporary camps erected, a telegraph line made, the canal cleared of timber for twenty miles, and a railroad twelve miles in length constructed and equipped. The biggest dredging plant in America, that was formerly used at Panama, has been purchased, and over a mile of the canal has been dredged. The exclusive franchise for the steam navigation of the San Juan river and Lake Nicaragua and an extensive plant for the Navigation Company have been acquired. The government of Nicaragua has acknowledged that the company has complied with the canal grant, which provides that \$2,000,000 must be expended the first year. It is shown that the amount of money spent to date on the enterprise is over \$6,000,000.

A METHOD of finishing doors and other woodwork that appears to be coming into favor is the following: The doors are of hard-wood and are filled with very dark filler; they are then polished in wax, when they present a semi-dull appearance that is somewhat pleasing. Ornamental beaded nails made of white metal are then driven in the doors at regular intervals but in a way to form a somewhat elaborate design of scrolls. Each of the doors leading into the same hall are finished in different designs as far as the nails are concerned, but the prevailing color is the same throughout. The effect is very good.

The stove works at Sheffield, Ala., have been completed.

BUILDING CONTRACTS.

THE nature of a building contract, says *Carpentry and Building*, is such that it frequently happens in the course of its performance that differences arise between the parties to it which render recourse to litigation necessary. A great deal of this could be avoided if in making the contract itself greater care were used and more attention were paid to the legal principles involved. At the outset of the consideration of the subject of building contracts it may be said that there is nothing in the law that requires that the contract be in writing unless it is some special statute or provision with reference to mechanics' liens. But as to the validity of the contract itself it is as good verbal as it is written unless by its terms it is not to be performed within one year. This is owing to the operation of the statute or terms under which a contract is not valid if by its terms it is not to be performed within one year, unless it is in writing and signed by the parties to be charged. But this does not mean necessarily a contract which is not to be performed within a year, but a contract which by its terms and upon its face cannot be performed within that time. However, as a matter of safety and practical convenience, it is a fact that building contracts are usually reduced to writing. When so written great care should be exercised for precision of expression, that there may be no misconstruction of its terms, and it should carefully provide for all possible contingencies which are likely to arise. The building trade is one which is subject to fluctuations of the market, to the exigencies of the weather, and in these days to more or less interruption from labor troubles, and all those things which are of common knowledge to the practical builder should be carefully and fully covered in the contract for the erection of a building. It should be borne in mind, in entering into a written contract, that when the agreement is reduced to writing all prior verbal negotiations are merged into that writing, and if there have been any verbal negotiations which are contrary to the letter of the written contract, or if there have been negotiations which are not covered by the contract, the written agreement is supposed to have been entered into with deliberation and to have superseded those prior and informal agreements.

THE WRITTEN CONTRACT.

It should be borne in mind that the written contract is but the evidence of the agreement of the parties, and of itself is of no binding force. Therefore should an agreement be reached and it be reduced to writing and either party fail to sign it, that does not affect the validity of the contract itself. Either party, upon failure of the other to comply with the terms of the contract, may proceed against the other for damages as if the contract had actually been signed. Of course, this principle of the law does not apply to those contracts to which reference has heretofore been made, which are void under the statute of frauds unless they are reduced to writing and signed by the parties. It frequently becomes the duty of the court, after parties having entered into contract, to construe those contracts. In the case of agreements involving special trades, like building contracts, the language employed is frequently of a technical nature. This language, when presented to the court for construction, is subject to explanation and definition by persons versed in the trade other than that the contract must stand for construction upon the language which is employed according to the ordinary use of the language. While it is true that the execution of a written contract thereby abrogates any verbal negotiations which may have been entered into by the parties prior to the execu-

tion of the writing, it is perfectly competent to modify that written contract after it has been executed by verbal agreement from time to time as the work progresses. For instance, where a contract provides that there shall be in no case any allowance for extra work, if extras are demanded by the owner upon a special verbal contract, they are furnished by the builder, and the recital in the contract that there will be no allowance for extras will not prevent the contractor from recovering their value, provided he can show a special verbal contract; or, if during the progress of the work the owner makes such changes in the plans and specifications that it is practically impossible to trace in them any likeness to the plans and specifications upon which the original contract was made, then the builder is at liberty to disregard his original contract both as to terms and price, and to charge for the work its reasonable worth and value, upon a contract for an agreed price.

RESULT OF VERBAL AGREEMENT.

In one case a contractor found that he was losing money and refused to go on. The owner thereupon verbally agreed that he would make him good for all the labor and stock he might employ, and further said that the contractor should suffer no loss by completing his contract. This agreement, though verbal, was valid and binding upon the owner; and upon the completion of the contract, the builder was entitled to recover, in addition to the contract price, such an amount as he could show he had expended over and above the price agreed upon in the written contract. These are cases in which the contractor assents to the changes which are made. But if a contract has been entered into, with reference to certain specifications, and the work is placed under the supervision of the architect who prepared the specifications; the architect has no right, without the consent of the contractor, to change the specifications upon which the contract was based. And upon his attempt to do so, the contractor may either abandon the work and recover for what he has already done, or, if he chooses, he may go on and charge such additional price as the changes in the work may make it worth. In making contracts with corporations for buildings, the builder should be careful that the contract is one that the corporation, or the officers who seek to make it, have the authority to make. In general, a corporation has a right to erect all the buildings necessary to conduct the business in which it is engaged. To go beyond this they must have special authority, either from the stockholders themselves or from the laws under which they operate.

THE fashion of staining white pine in imitation of more expensive woods is not in good taste. The sham is at once apparent, and the effect is garish and vulgar. White pine itself is a beautiful wood for interior finish if properly treated, but the soft silky texture or the grain is spoiled by the attempt to imitate walnut or cherry. Where other than the natural color is desired, artistic effect may be produced by some of the aniline dyes, and staining in the various tones of green. Light brown and yellow preserve the texture and grain of the wood and may be made to harmonize with any ordinary surroundings.

It is reported that the compress at Waco, Tex., recently compressed 1,346 bales of cotton in nine hours and five minutes. They claim they have beaten the world's record.

The greatest progress in regard to industries has been made by Charleston, S. C., owing, no doubt, to the development of the phosphate industry.



WATER AND WASTE PIPES IN DWELLINGS.

THE leakage of water pipes behind decorated walls and in fine ceilings, says the *Mechanical News*, is a sufficient argument against casing or covering service pipes. The repairs are generally costly in themselves, and they entail the additional services of the carpenter and decorator, as well as those of the plumber. Pipes in casings, or set in walls or partitions as they pass from floor to floor, provide especially inviting runways for mice, rats and vermin of all kinds. Nests are built in these places, scraps of paper, rags and food are carried into them and they become filthy. It is only necessary to remove a covering board from almost any casing to prove this point in a most convincing manner. Even those in comparatively new buildings will be found surprisingly foul.

These casings or wall pockets, as the case may be, serve another and usually unexpected purpose. They act as ventilators and distribute odors from the kitchen and cellar to all parts of the building. In the performance of this duty they are faithful and impartial. The hollow walls and floors which are nearly universal in the American system of construction greatly assist in this work. Many of the fine French flats which were first erected in the city of New York are now rented with difficulty, owing to the odors which pervade them. When they are shut up for a short time they are almost unbearable. Rents have of necessity been reduced to one-third the original figure from this reason alone. The fault is usually found in the careless and ignorant management of pipes and their cases. The odors from the kitchens are carried everywhere. Stale odors from closets and from food from kitchen and garbage boxes are mingled and distributed with perfect fairness to all the occupants. The large air-shafts, usually held responsible for this state of things have very little to do with it. The casings open at the ceilings of each kitchen, communicate with all the floors and wall spaces and usually take their supply of odors from a point very near the range. All of them are directly connected with the cellar, and usually start in some way from the janitor's kitchen.

Numberless complaints, coming from new flats of sewer-gas, are finally traced to the odors of cabbage, turnips, ham, onions, etc., which have come from the janitor's kitchen. In many buildings this kitchen is directly under the parlor of the first floor apartment and is separated from it by one thickness of boards and an inch of plastering. That there should be foul smells on the first floor is not to be wondered at. Tests of the plumbing in these cases are made and its protection proved.

There is nothing to be said upon the other side of the question.

There are no good reasons for putting pipes out of sight. When people say, in the face of these facts, that they cannot bear the suggestiveness of having the pipes where they are visible, they make an acknowledgment that they prefer hidden filth, danger to life, health and property, to a right construction. Life and health

cannot induce them to accept and frankly tolerate their plumbing work.

Pipes carried openly through a building are not dangerous because their condition can be constantly observed. If accidents occur the point at which the break takes place can be reached at once and repairs easily made. The quality of the work gains materially because the plumber takes pride in putting up the work which is to be exposed.

Exposed pipes may be made to pass through floors without leaving an opening. The floors around the pipe can be made perfectly tight, and the passage of odors cut off completely—at least as perfectly as the nature of the plaster will permit. This is an enormous gain, while the runways for rats and mice, roaches and water-bugs, are entirely done away with. These vermin can be exterminated. This is practically an impossibility in houses where castings protect them and afford perfect breeding places. Cut off from free passage to all parts of the house they prefer more congenial quarters, where rapid transit and fields for colonization are provided.

As decorative features of the rooms cast pipes at least are often treated in a beautiful way. The body of the pipe is colored a very dark bluish grey, scarcely removed from black. The bands are silver or nickel bronzed or have silver or nickel leaf applied to them. Occasionally the whole pipe is finished with two or three shades of bronze. Lead and wrought iron pipe receive somewhat similar treatment. The lead is often polished and varnished. There is, however, no difficulty in making the decoration of the pipes strikingly effective.

It is satisfactory to know that architects and builders are beginning to break away from the old custom and expose their pipes wherever the prejudices of the owner can be overcome. Some of the best men in the profession are treating the plumbing work in a manner to show constructively its importance and value. The result is a great gain to owner and occupant.

THERE have unquestionably been many cases of poisoning, with results of more or less gravity, from the use of water which has stood for some time in a lead pipe. On the other hand, apprehension is felt in many instances where there is no real ground for it, or where, at all events, a very simple and easy precaution will avert the danger. It is well to understand what are the actual sources of injury and the conditions which bring it about, so that there may be neither culpable neglect for unnecessary alarm. In the first place, water is not poisoned by merely passing through lead pipe, especially if the distance is short. In order to form the soluble oxide of lead, which is the poisonous agent, the water must be for some time in contact with the lead. Where the water stands in the pipe, opportunity is given for this contact; and the proper thing to do, therefore, is to let the water run long enough before using it to empty the pipe of its contents. Where water is frequently taken from the pipe during the day it will ordinarily be a sufficient safeguard if the pipe is emptied in the morning by letting it run for a few minutes before using. Again hard water is less liable to become poisonous than soft water, as the hard water forms a coating of the insoluble carbonate of lead on the inside of the pipe, and this tends to prevent that contact of the water with the lead which must take place before the poisonous combination above described can occur. Of course, after all is said, the best guarantee of safety is to discard the lead pipe altogether.

Pneumatic tubes are now in use in most telegraph and newspaper offices.

SEWERAGE AT THE WORLD'S FAIR.

THE system of sewerage at the World's Fair is a combination of several methods of disposing of sewerage and will be given a thorough and lasting trial, which will settle for all time its claim as being the best solution of the problem of efficiently disposing of immense quantities of sewerage. It ingeniously combines the disinfectant and cremation methods, so as to leave absolutely no noxious residue.

In each building the sewage pipes concentrate in two large oval tanks called ejectors. These tanks when filled are arranged to automatically open an escape pipe at one side, while on the other side the compressed air tap is opened. As the air rushes in it forces the waste material out until the tanks empty, when the valves reverse and the tanks again fill.

The sewerage mains lead to the southeast corner of the grounds, their contents being forced along by compressed air operated at a pressure of 100 pounds to the square inch. At the main terminals are erected four large cleansing tanks fifty-four feet high and twenty-five feet in diameter. In the center of each tank is a large stand-pipe open at the top and bottom. The large tanks are connected to work in pairs and are clustered about a five-foot stand-pipe, through which the sewage is forced to a smaller fifth tank, the lower part of which is on a level with the tops of the large receivers. As the sewage in its passage through this apparatus reaches the small central tank it receives a quantity of a disinfectant chemical. The quantity of the chemical used is gauged according to the volume of waste passing through the pipes, which pass from the disinfectant tank to the central stand-pipes in the large tanks. As the fluid mass reaches this stand-pipe the current is so slowed by the quantity of water in the receivers, amounting to some thousands of barrels, that it is practically rendered stagnant by the time it reaches the bottom of the pipe and seeks its level in the fluid surrounding. This gives the solid portion of the waste which is already being precipitated by the action of the chemicals time to settle, leaving a perfectly clear, supernatant liquid. A second set of sluices leads from the tops of the receivers and into pipes conveying to a large escape main, which conveys the fluid into the lake.

At the bottom of the receivers are placed valves, which open into pipes leading to a compressor. Through these pipes the sediment is drawn and pressed dry by a hydraulic apparatus. The resulting material is immediately cremated. Thus every vestige of disease-producing waste is destroyed.

SATISFACTORY experiments have been made by the city of Boston with the furnace erected for the burning of garbage. It is built of brick and will, it is said, burn four tons of garbage an hour. It is about twenty-five feet long and ten feet high. The fuel is gas, made in the furnace by combining crude petroleum with hot air and steam. At the present time the city is dumping in the outer harbor such parts of the garbage as cannot be sold. A boat has to be hired to carry it there, costing \$40 a day. The part that is sold is carted to the Albany street yard and purchased by farmers, who take it away. The city has realized about \$30,000 a year from these sales.

In the Lackawanna coal mines the average monthly boring is over 3,000 feet.

The capital invested in manufacturing in seventeen Southern cities is \$218,061,686.

HERR SCHWERZER, a young Vienna sculptor, is working at the reproduction and restoration of the sculptures in the tympanum of the Parthenon at Athens. He has almost completed the western tympanum in which Phydias pictured the combat of Athene and Poseidon for the Attic country. Herr Nikolaus Dumba, the Vienna patron of arts, furnished the artist with the means for studying the remnants of the sculptures in Athens and London.

THE Massachusetts State Board of Health during the past year made additional experiments on sewage filtration at Lawrence, the object being to determine the efficiency of filtration in the effort to remove bacteria. In order to test the matter filters were supplied with water containing large quantities of typhoid bacteria and other recognizable forms. By comparing the filtered with the unfiltered water the efficiency of the treatment could be determined. Fourteen filters were used. Typhoid bacilli were applied to ten filters on twenty different occasions. All of the bacilli were removed in ten cases, 99 per cent. in some cases, over 98 per cent. in two cases, and 97.22 per cent. in the remaining filter. In many of the above cited cases of experimental treatment the water contained millions of typhoid bacilli to the cubic centimeter, a much increased number over that found in ordinary sewage. For this reason it is claimed a larger percentage of the bacilli passed through the filter. The experiment demonstrated that deep filters were more effective than shallow ones, and that low rates of flow from the filter are safer than high rates. It is claimed that by sewage rates of flow as many bacilli will be removed by continuous filtration as by intermittent. Previous experiments, however, show that organic matter in the sewage is easier destroyed by intermittent filtration, and the formation of film on the filter service does not appear to affect the results.

THE *Mechanical News* suggests the abolition of the elevator shaft as at present constructed, as dangerous in case of fire. It wants to know why the shaft cannot be avoided by placing the elevator outside of the building. The shaft would then be reduced to a mere skeleton. One post carrying a guide and a roof at the top would be all that would be needed. Even the one post might be omitted and both guides placed on the wall of the main building.

The car would be entered by doors as usual and would itself be heated in winter by steam or hot water by a flexible pipe. The entrance to the building from the car could be protected after the fashion of "vestibule" cars, the vestibule coming into action as the car door opens. The whole scheme would present no great difficulties in a mechanical way.

In addition to safety, our contemporary enumerates other points of advantage. An external position for an elevator could in many cases be found which would save much valuable space within the building itself. The absence of any unobstructed passage from the bottom of the building to the top would be an enormous advantage in securing safety in buildings which are not fire proof. In those which are, there would be a gain because in burning out a floor containing much combustible merchandise there would be no flue to increase the draft or bring air to feed the flames.

At a recent rain experiment in Texas a powerful explosive was used, calculated to supersede dynamite. It is called rosellite, after Dr. Roselle, the inventor.

The Memphis Carriage Company, of Memphis, Tenn., has been chartered.



THE first electric telegraph line was laid in Switzerland by Lessage, in 1782; the Morse transmitter was invented in 1837.

THE Pennsylvania railroad is equipping its anthracite collieries with electric light plants, and will cut coal twenty-four hours a day.

THE celebrated high electric light mast at Minneapolis, which is 257 feet high, has proved ineffective for lighting purposes, and is now no longer used.

A FRENCHMAN has discovered by means of a recently improved pyrometer that the temperature of the average incandescent electric lamp is about 3,300 degrees F.

IT is said that a man in Columbus, O., has patented an electrical device intended to automatically lower and raise railroad gates at grade crossings at the approach and after the passing of trains. The apparatus is expected to entirely supplant flagmen and gate tenders.

THE Washington and Baltimore Boulevard and Electric Railway Company recently incorporated, is now at work on the largest electric railway project now on foot in this country. The road is to be completed within two years. It is proposed to run trains at the rate of sixty miles per hour. The fare from Baltimore to Washington will be twenty-five cents.

IT does not seem now beyond the range of possibilities that when one wants to hear some great diva in the near future, all that he will have to do will be to go to his telephone and, comfortably seating himself, say: "Hello, central, give me the Grand Opera House, Paris," or London, or St. Petersburg, as the case may be, and then with his receiver at his ear listen to the enchanting notes that are sung at a distance of several thousand miles. We are coming to it.

THE electric motor turns the drill of the dentist, under the manipulation of the rhinologist bores out the noses, and runs the saw and the trephine of the surgeon, and in divers other ways is caused to help the physician, surgeon and specialist. The electric light is made to illumine all the cavities and interiors of the human body. It is nothing now to put an edescope into the stomach and scrutinize its walls from one end to the other. Electricity furnishes heat to the cautery, with which morbid surfaces may be healed, wounds stimulated and tumors extirpated.

One of the new features of electric medication is the introduction of drugs into the human body through the skin.

Tecumseh (Ala.) Mining Company is getting out from 6,000 to 7,000 tons of ore, which is principally shipped to Tennessee furnaces.

Some of the concrete blocks in the Victoria docks, London, weigh 350 tons each.

THE ELECTRIC LIGHTING OF ROME.

ONE can hardly imagine, says the *American Architect*, what Julius Cæsar, or, let us say, Cato the Censor, would have said, if he had read in the Sibylline books that a company of Scythians would, two thousand years after his death, install an apparatus through which the streets of Rome would be illuminated every night by a cascade at Tibur, twenty miles off in the Alban Hills; yet that is just what has come to pass. Several years ago an Italian company undertook the utilization of the Tibur, or Tivoli, water power, by means of turbine wheels and dynamos, for the purpose of lighting the little town of Tivoli. Soon afterward, the establishment passing under the control of the Roman Gas Company, the plant was increased, until it now collects and transmits a force of twenty-seven hundred horse power, and wires have extended to Rome. The experiment proved so successful that it has now been determined to utilize the whole available force of the cascade, amounting to about five thousand horse power, and the contract has been intrusted to a firm in Buda-Pesth, Hungary. The current will be transmitted, at a pressure of fifty-one hundred volts, through copper cables, protected with special care, as they must cross the desolate Campagna, and would otherwise be at the mercy of brigands. The cables enter Rome at the Porta Pia, where the current is converted by thirty-two transformers into one or two thousand volts, this being the pressure for which the city system of electric lighting is designed. In the city itself preparations are being made for increasing greatly the lighting plant. In place of two hundred and fifty arc lamps, the present number, six hundred will be installed, and the system, when complete, will be the most important example of transmission of electric force in the world.

FIRE underwriters are becoming convinced that a large proportion of the fires that occur and are reported as of unknown origin are due to defective electric wires. The difficulty does not lie with the electric lights themselves nor with that system of lighting, but with the unskilful manner in which interior wiring is done. If the wires are properly insulated they may be strung anywhere, and will give safe conduct to the electric current, but the moment the insulation is disturbed there is danger. It is customary in wiring buildings to run the wires in the most convenient places, and hence they are brought in contact with woodwork, with shelf goods, with old papers and waste of all kinds, and the insulation is readily broken by handling, being rubbed against, or other careless manner. The president of a fire-insurance company recently stated that the building in which he is located had been on fire three times within a few months, and in each instance the cause was ascertained to be a defect in the electric-light wires. Opportune discovery probably prevented a serious fire, but had such occurred it would have been classified under the heading "cause unknown." The combined wisdom of fire underwriters and expert electricians should be able to provide a remedy for bad and dangerous wiring of buildings. It may be necessary to insist that all wires shall be placed in some sort of tubing that is a non-conductor, and all contact with woodwork absolutely prohibited. The number of fires from unknown causes is rapidly increasing, and it seems reasonable to charge them to the increasing use of electricity for illuminating purposes.

A company has been organized at Baltimore, Md., for the purpose of manufacturing cakes and crackers. Capital stock invested \$300,000.

IT is, of course, assured that the exhibit of electrical appliances at the World's Fair will be a presentation of apparatus worthy of the occasion. This exhibit cannot fail to be the center of intense and inquisitive interest, and will probably be not less than a revelation, both of science and progress, to the majority of visitors, both home and foreign. All available space in the electricity building is now allotted, with numbers of applicants unable to enter their exhibits. The historic occasion will be not only unique in its representation of electrical progress, but will be equally potent as a stimulus to electrical enterprise, both here and elsewhere.

A NEW method has recently been discovered by which caustic soda, chlorine and other chemical products can be made from the brine directly by the aid of electricity. The new process effects a saving of 50 per cent. on the cost of the present methods. It is much simpler, the caustic soda being produced from the brine direct in one operation instead of two. The valuable chlorine is also saved and utilized for the production of bleaching powder. Hitherto the ocean has contributed nothing beyond a little table salt to the world's wealth, but it has other and valuable salts in solution, and the new discovery affords promise of extended economic application.

IT is announced that the United States lighthouse board will introduce electric lighting in the light-houses along the great lakes.

In 1887 there were only thirteen electric roads working throughout the entire country. There are now in the United States and Canada over 500, representing a capital of over \$200,000,000.

One of the latest inventions in connection with the application of electricity to street car service, is a self-lubricating gear for trolleys, which needs no attention after being once put in operation.

Ten new electrical stamping machines were received at the postoffice in Chicago and put in position by an expert from Boston. They will greatly facilitate the handling of mail, doing away with the necessity for one handling of first class matter.

THE manufacture of electric hand lamps must be numbered among modern electrical industries.

Many improvements have been lately made in the construction of these portable and convenient lights. A small storage battery is used, the active material of which is lithamode, a substance which is likely to be largely used for such purposes. Electric hand lamps are not only used by travelers for reading in railway cars, but they are employed for medical, dental and photographic purposes, as an illuminant in gunpowder mills and stores, in coal mines, petroleum ships and stores, in gas and chemical works, and anywhere that the use of a good and perfectly safe light is absolutely necessary. One special form is made with a five-cell battery, and is much in request by lecturers, photographers, and others who desire to project a light on a paper or other object and at the same time to shield their own eyes. Another form is a special "pocket" battery of the two-cell type. This handy little lamp will give a good light for a period of four hours with one charge, and is so light and compact that it will go comfortably into the coat pocket, and can be turned on at a moment's notice.

The United States is fast crowding Switzerland out of the watch market. To-day American factories turn out 35,000 watches a week.

THE CATHEDRAL OF MILAN.

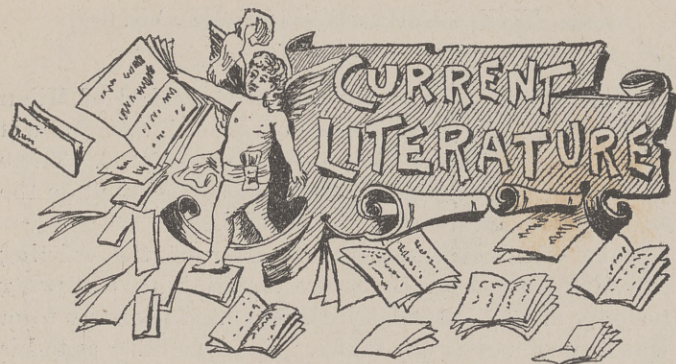
THE corner stone of the famous Cathedral of Milan was laid by Gian' Galeazzo Visconti, first Duke of Milan, on the 15th of March, in the year 1386. There had been three successive structures of the kind on the same spot before this one was begun.

Duke Gian' Galeazzo, the founder of the existing cathedral, gave liberally to the undertaking, bestowing not only money but also a fine white marble quarry from which the material was taken. Opinions differ as to his motive. The more charitably disposed attribute his generosity to public spirit and a desire to encourage the arts; but others say that he had murdered his uncle and two cousins in his castle of Frezzo—not an unheard of method of disposing of inconvenient relatives at that period—and engaged in the church-building enterprise as an expiation of his crime. At all events he prosecuted it with energy, procuring the services of the best architects of the time, and so did his successors. The octagon cupola was vaulted in the period between 1490 and 1522. The three western divisions or arches of the nave were finished in 1685, and the central tower and its terminal spire in 1772. Shortly after the French Revolution broke out Europe was shaken with war, and work on the cathedral was stopped. But Napoleon in 1806, ordered work to be resumed, and it has proceeded without serious interruption down to the present day.

It was Mark Twain who said of the Cathedral of Milan that he "liked to revel in its dryest details," which indeed takes on something of a poetic flavor, so splendid and colossal is the work which they describe. Here are some of the dimensions: Extreme length 486 feet; breadth of the body 252 feet; between the transept ends 288 feet; width of the nave, from center to center of the columns, 63 feet; height of the crown of the vaulting in the nave from the pavement 153 feet, and height from the pavement to the top of the statue of the Madonna, which crowns the spire, 355 feet. The cathedral is the largest in Italy except St. Peter's at Rome. The ground plan is a Latin cross, terminated by an apse in the form of five sides of an octagon. The body is divided into a nave and four aisles by four ranges of colossal clustered pillars, with nine intercolumniations. The transepts and the chancel end are divided into three aisles. The vaultings of the roof spring directly from the pillars fifty-two of which support the pointed arches on which it rests. The total height of each pillar of the nave and chancel is 80 feet. There are niches and pinnacles on the exterior for 4,500 statues, of which about 3,500 have been placed.

A TOWER of unique design is being erected at the World's Fair at the eastern entrance of the midway plaisance. It will be 560 feet high and 200 feet wide and the ascent to the summit of the structure will be accomplished by electric cars which will run on a spiral road-bed. The road will have an 8 per cent. grade, and at night will be illuminated by incandescent lamps. The company having the matter in hand claims that the electric road will have a carrying capacity of 12,000 passengers an hour.

THE readers of THE SOUTHERN ARCHITECT will do well to confer with the General Electric Company whose Southern office is located at 10 Decatur street, Atlanta, Ga., for any information desired regarding either Edison or Thomson-Houston Electric Apparatus, or for proposals to wire public or private buildings for electric lights.



BROWNING AND TENNYSON.

BROWNING and Tennyson never befouled their "singing robes" with the filth of so-called "realism," as taught by the popular French school of to-day, and its no less vile English and American imitators. They kept themselves free from sensual defilement; the breath of their muse was really divine afflatus; the fire upon their altars came direct from heaven.

Archdeacon Farrar alludes to the purity and refinement of Browning's and Tennyson's poetry, and THE SOUTHERN ARCHITECT believes that its readers will enjoy reading the following quotation from Farrar's recent article on Tennyson; his description is as true as it is beautiful:

The poets have made life brighter, happier, more hopeful to us by teaching us to see, and what to see, and how to see; by opening our minds to the true, our eyes to the beautiful; by opening our ears to the voices of the mountain and the sea; by quickening our sensibility to the sweet influences of the fields and of the ocean. A thousand things which we should never have noticed, in which we should never have read God's autographs of beauty and of blessing, Tennyson has now taught us to observe with delight and love—the black ashbuds in spring; the rosy plumelets which tuft the larch; the pure green streaks on the white snowdrop; the gummy chestnut buds which glisten in the April blue; the seawind singing shrill, chill with flakes of foam; the liquid azure bloom of the sea; the Pleiades glittering like fire-flies in a silver braid; the little pink, five-beaded baby soles; the light feet which treading on the daisies make the meadows rosy; the dragon-fly's sapphire flash of living light; the river sloping to plunge in cataract, shattering on black blocks its breath of thunder;

"Myriads of rivulets hurrying through the land,
The moan of doves in immemorial elms,
And murmur of innumerable bees."

The *Century* for March contains a unique feature in an account from the manuscript of Captain Thomas Ussher, R. N., of "Napoleon's Deportation to Elba," in which is given a familiar account of all the circumstances of the trip, and a careful report of Napoleon's frank comments on men and events. The article is preceded by a portrait and a short sketch of Captain Ussher, who was the officer in charge, and the frontispiece of the magazine is appropriately an engraving from the bas-relief of Napoleon by Boizot, which was the property of Joseph Bonaparte, and is now in the possession of the Pennsylvania Historical Society. Napoleon's comments on Blucher, and on the proposed invasion of England, are particularly interesting. The paper bears evidences of being a careful contemporary record, and has accordingly historical value as well as popular interest.

A LARGE first edition of the March *Century*, containing the *Reminiscences of Napoleon at Elba*, was ready on the first day of March.

"The Making of a Man," by the Rev. Dr. J. W. Lee, of Atlanta, which has found more readers in the short time that it has been before the public than any other book of its class, is now enjoying the unusual distinction of being translated into Japanese. The work is being done at the instigation of American missionaries in Japan who say that the work is particularly well adapted to the cultivated Japanese mind, to which the physical, moral and intellectual development of man is an absorbing subject. Already a large number of English copies of the book have been ordered from the Cassell Publishing Company for circulation among the English reading Japanese, and it has made such a profound impression that an edition in the language of the country was demanded.

Worthington's Magazine for March is a royal number. Evidently this vigorous young magazine is growing and thriving, since, though exceptionally bright from the start, each number steadily gains in interest, attractiveness and value, and its success in catering to the varied tastes and requirements of the American family at home proves its ability to give valuable points to many an older and more experienced periodical.

The complete novel in *Lippincott's* for March, "Waring's Peril," is by Captain Charles King, the laureate of our little army. No living author is more sure of an eager audience, or more certain to hold and delight his readers. No one knows more thoroughly the matters of which he writes, and no one else can describe them with such graceful and natural art. His stories always have a plot; his characters are living men and women; he makes the barracks, the march, the battle-field, as near to us as if we had been there; and he clothes them in something of "the light that never was on sea or land"—for he is a poet whose poetry insinuates itself through practical and most readable prose.

The Journalist Series is carried on by Elizabeth G. Jordan, who tells "The Newspaper Woman's Story." It is illustrated. Charles Robinson furnishes an interesting account of "Some Queer Trades" carried on in New York, Philadelphia, London and Paris. Robert Edgerton writes briefly of Marie Burroughs the actress, whose portrait is given. C. H. Crandall objects to "The Selfishness of 'Mourning,'" and proposes the abolition of black garments as "a relic of barbarism." Louise Stockton puts "Our Side of the Question," which is the novelist's side. M. Crofton, in "Men of the Day," talks of Thomas Hardy, Alma Tadema, Chief-Justice Fuller and Russell Sage.

Owing to the general demand from authors all over the country for more time in which to prepare their stories for the fiction prize of \$50 offered by *Fetter's Southern Magazine* (Fetter & Shober, Louisville, Kentucky), the publishers announce that the time has been extended to May 1st, when the contest will close and the successful competitor will be announced. When the story is published a portrait and sketch of the author will accompany it.

Nothing could be more timely and nothing could be more well-informed than the companion articles in the *Review of Reviews* for March upon America in Hawaii and England in Egypt. The discussion of American influence in Hawaii and of the strategic value to the United States of the Sandwich Islands, is from the pen of Mr. Sereno Bishop, than whom no other man in Honolulu is better qualified to discuss the subject. The *Review of Reviews*, by the way, comes out in this number taking very strong editorial grounds in favor of the complete annexation of Hawaii. The article on England in Egypt is from the pen of Mr. Stead, and is based upon the brilliant new book of Mr. Alfred Milner, who tells the story of the English occupation of Egypt and of the achievements of English Administration there during the past ten years.

TRADE~ NOTES:

J. A. FAY & EGAN COMPANY.

THE TWO MAMMOTH CONCERNS TO COMBINE MARCH 1.

The negotiations that have been in progress for some time for the consolidation of the two great companies of J. A. Fay & Co. and the Egan Company are now complete, and the officers of the new J. A. Fay & Egan Company will take charge about March 1.

The successful bringing together of these two companies, which have for so long been the sharpest of business rivals, is a piece of engineering that reflects the skill of those who managed the negotiations. The new company will be the largest of its kind in the world, and just as the two which compose it have always stood at the very front of enterprise in their respective lines, so it may be expected that the new company will occupy an even more conspicuous and influential place.

The directors of the new company will be Thomas P. Egan, Frederick Danner, W. H. Doane, D. L. Lyon, David Jones, W. P. Anderson, Joseph Rawson, S. P. Egan and Edwin Ruthven. Thomas P. Egan will be president and the soul of the enterprise, as he has been of the old Egan Company. Mr. Danner will be vice-president, S. P. Egan superintendent and Mr. Ruthven secretary. These four officers are of the Egan Company.

The Egan Company was formed about 1873, the start being in a small way. Mr. Thomas Egan was in the original company with two partners. In 1880 there was a separation of interests, and a stock company was formed with Mr. Egan, his brother, Fred Danner, Florence Marmet, Samuel C. Tatem, John Mitchell and others interested. The start was made on Central avenue, but in two years the factory was moved to Front street in a building 30 by 80 of three stories, and a part of which was rented to other firms. But the business grew so rapidly under Mr. Egan's hustling management that the tenants had to get out. Mr. Egan was a believer in advertising, and he spent more money in that way than any other firm in the same line of business. But he had results from it, and the business grew. Additional land had to be bought and new factories built, until now the buildings cover the square bounded by John, Front, Central avenue and Greenleaf streets.

Under the management of Mr. Egan the success of the new company is assured. He has filled every position in the factory from workman to president, and there is not a detail in the business that he does not thoroughly understand. He is a general among men, and no one in the city can handle them more skillfully.

The original J. A. Fay & Co. was established in Keene, N. H., about 1835. The business soon extended into the West, and on account of the difficulties and expense of transportation it was determined to establish a branch in Cincinnati, the most central of the large cities of the country. There was no through railroad from the East, and freight had to be carried by the Erie canal to Buffalo, by steamer thence to Cleveland, and by canal to Cincinnati. The frequent handling of goods required in making a shipment and the freight charges made it so expensive that transportation charges exhausted about all the profits. So the Cincinnati branch was started about 1850 as a sort of distributing point for the West and Southwest. The beginning was in a small way, and the managers were John Cheney and C. E. Reed, both now dead. The business did not grow as desired by the home office, and Mr. W. H. Doane, who had been connected with J. A. Fay & Co. since 1851, was placed in charge of the Cincinnati branch. This was about 1860. He took hold of things in his characteristic, energetic way and made them go. When he took charge there were not more than fifteen men employed in the works. Now there are over five hundred. As the business extended Mr. Doane added building after building until a whole square has been covered. At the same time that he has been personally attentive to every detail of the business he has gathered about him men of the same energy and activity as himself. The business has been pushed with every influence that could be brought to bear from the time Mr. Doane took charge, and so it has come that the product of the factory of the company can be found in every civilized country of the globe. It was not long after Mr. Doane was given the management of the Cincinnati branch until it had grown to be greater than the home plant, and soon absorbed it. Mr. Doane has ever since been president, treasurer and manager of the business, and he and D. L. Lyon, his brother-in-law, as vice-president and secretary, have controlled the concern, holding considerably more than a controlling interest.

Koppe Bros. & Steinichen, 119 West Mitchell street, Atlanta, have an advertisement in this issue which will be of interest to architects and builders. The *papier-mâché* work of these gentlemen, as well as their work in plaster and in carved wood, is of the most elegant and artistic kind. Fine art interior decorations in unskillful hands become disfiguring monstrosities, but in the hands of an expert artist, guided by the intuitions of genius, they become a thing of beauty and a joy forever. We are glad that this city can boast of representatives that come up to this ideal standard, and we predict for this firm of excellent artists a long and successful career.

BERGER BROS.' EAVE TROUGH HANGERS.

We invite special attention of architects and builders to Berger Bros.' advertisement in this issue to their patent trough hangers and pipe fasteners. They claim to handle more stock and variety of this line in roofers' supplies than any other in the country, having made this line a study more than sixteen years, going from shop to shop making themselves familiar with all the different modes of constructing gutters to the eaves of buildings, either on top or outside, the kind of gutters used in different sections of the country as well as the different appliances used in hanging them. No tinner can have any idea as to all the different sizes and shapes of gutters and beads used, either rolled or solid or slipped on in their several shapes, making it necessary to keep a great variety of stock and fixtures to accommodate the trade. Finding all manner of complaints and defects in the old way, and compliments in the new improved method in the use of long eave gutters of standard sizes, slip joints and the use of first-class hanger for them. In many parts of the country home-made gutters, with their many seams, defects and variations, are almost entirely abandoned, as well as strap wires, cross-bar hangers, formerly used in hanging troughs from the shingles above instead of supporting them from below and to the cornice. Architects are adopting this principle in many parts of the country on almost all kinds of modern buildings instead of the usual gutters formed on the roof with so many defects and complaints in constant leaks, expensive repairs, annoying drippings from the course below, banking up the snow, causing dangerous snow-slides over the gutters, as well as a waste of money to the owners, who have been obliged to have them torn out within a few years from the time they were put in. It is a well known fact that such gutters are more or less unsightly; that they are exceedingly troublesome and costly to repair, and in certain climates they will leak in spite of great care in putting them in; that metal being colder than shingles, the water thawing from above will freeze on the metal until it backs up and runs over the upper edge, causing the leak.

Live architects everywhere should plan their buildings and specify such troughs and improved fasteners on modern mills and factories, and save their customers extra cost, also future expense and annoyance in leaky roofs.

I take great pleasure in announcing to you the completion of my several new large furnaces, which, added to my previously increased facilities for bending and beveling glass in the most skillful and workmanlike manner, enables me to handle all work in a more expeditious and satisfactory manner, which cannot but prove very gratifying to the trade. Having now the advantage of new, improved and superior facilities over the old method of bending and beveling, I am prepared to bend and bevel glass for coaches, hearses, show-cases, steamboats, offices, banks, railway cars, clocks, lamps, bow windows and large bent plates for store fronts, etc. We also carry in stock all sizes of the best selected crystal plates, also 3-16 plates for carriages, also selected mirror plates, plain and beveled for the furniture trade. Orders respectfully solicited and promptly executed on the most reasonable terms. Earnestly soliciting a share of your patronage, I remain,

Very respectfully yours, M. A. SMITH.

The Atlanta Manufacturing Company, 40 to 46 Courtland avenue, print their card in this issue. They manufacture bank, bar, store and office fixtures, stairs, mantels, desks, and all kinds of superior cabinet work. Though only six months old, the firm has placed itself in the fore-front of our most prosperous industries, employing sixty hands, which number will soon be increased, as they are overwhelmed with orders. This shows what tact, enterprise and first-class workmanship can accomplish. The officers of the company are as follows: Charles A. Breen, president; Henry Simmons, vice-president; T. H. J. Miller, secretary and treasurer; Albert Schroeder, superintendent.

After many years of experimenting with the various Graphites of the world, we are able to lay before the public a pencil that is, without question, immeasurably superior to anything that has hitherto been produced, both regarding its erasing and its delightful, smooth writing qualities. The many testimonials which we are now receiving regarding it prove that it has already secured the approval of many who are able to judge. These pencils may be had on application through your usual stationer. Koh-I-Noor, made by L. & C. Hardtmuth at Vienna; Philadelphia agents, F. Weber & Co., 1125 Chestnut street.

We are very much pleased with the outlook for the coming year. We are now putting in a large electric elevator for the Pioneer Implement Co. of our city, also one in the Soap & Starch Co.'s place at Sioux City, and are figuring for several others. We are now in position to furnish any kind of elevator desired, and will be pleased to hear from any wanting either hand or any kind of power elevators.

Yours, KIMBALL BROS.

PHILADELPHIA, February 14, 1893.

It may be of interest to your readers in the South, in view of the fact that there may be considerable use for disinfectants during the coming season, to know that we have recently commenced the manufacture of copperas in this city and Pittsburg, and will be glad at all times to name to druggists and municipalities low prices for the article intended to be consumed in this manner.

Yours very truly, THE S. P. WETHERILL CO.

The Atlanta Mantel Co. are furnishing the mantels for the block of houses now being built by a Chicago syndicate in West End.

Mr. Henry Wolters, the well known architect of Louisville, Ky., whose ability is unquestioned, has prepared plans for a magnificent apartment building to be erected at the southwest corner of Third and Walnut, and it is probable that the building will be under way early this spring. It has been calculated to make this building one of the handsomest of its kind, as well as the most modern and convenient, west of New York.

The National Tobacco Works, branch of the American Tobacco Co., Louisville, Ky., are about to commence the erection of a costly new factory building at 26th and Broadway in that city, in which they will have increased facilities to manufacture their celebrated "Piper-Heidseick" brand of chewing tobacco.

The Frank A. Menne Candy Co., Louisville, Ky., will move into new quarters on March 1st, corner 13th and Rowan, which they will make a model candy factory. The Southern Engineering Co., of that city, are installing for them an 80-horse power Tubular boiler and a 40-horse power engine and 110-light incandescent electric light plant.

The Finzer Bros. Tobacco Co. are having the Southern Engineering Co. install for them an incandescent electric light plant of a capacity of 500 lights, which includes a 60-horse power Ball & Wood automatic dynamo engine and a 500-light Card incandescent dynamo.

The Sun & Ackerman Brewery, Louisville, Ky., has just been transformed from darkness to light by the aid of the 250-light electric light plant installed by the Southern Engineering Co., comprising a 30-horse power Houston, Standwood & Gamble engine and a 250-light Wood automatic dynamo.

M. L. Ross's residence, which is illustrated in this issue of our Journal, is being built with pressed brick and trimmed with Georgia marble. Main departments on interior will be finished with select quartered oak, will have inside blinds throughout, slate roof, finished attic, etc.; cost complete \$16,000.

The Jas. S. Haven Co., Cincinnati, O., manufacturers of all kinds of elevators, are pushing their trade Southward. Evidences of their work and skill can be seen by every person who visits the large Equitable building, Atlanta, Ga., where four of their elevators are constantly in use, and work with all the ease of clock work.

S. C. Johnson, whose advertisement appears in this issue, claims to have the best material for finishing all kinds of hardwood floors. It is a wax, which neither scratches like shellac nor gathers dust like oil.

Attention is called to the Decorative Art Co. of 126 West Eighth street, Cincinnati, O., whose advertisement appears in this issue of our Journal. Write to them for catalogue and prices.

The contract for window screens for the Concordia building has been given to the Portland Screen Co.

The Portland Screen Co. has contracted to screen Rev. Mr. Sasnett's, Mr. Stanton's and Major H. M. Abbott's houses at Manchester.

M. J. Collins, of Venable Bros. & Collins, has awarded his contract for screens to the Portland Screen Co.

DEAR SIR—We beg leave to inform you that we are now in position to furnish designs of fine art interior decorations in *Carved Wood, Plaster and Papier machi*, and to execute same in any style.

With our experience in both Europe and America and six of the best skilled wood-carvers, we are enabled to fill any order in the shortest possible time and at a moderate price.

We call special attention to our *Papier machi work*. We furnish caps, panels, brackets, mouldings, wreaths, etc., in this material, also decorations for walls, ceilings and mantels. *Papier machi* stands the weather, and for this reason is especially valuable for exterior decoration of houses. It is also the cheapest decoration, as it costs about half as much as wood. It can be stained in any color.

Most prominent architects and manufacturers rank among our regular customers, to whom we always give entire satisfaction. We would also be pleased to receive a share of your esteemed patronage, and feel certain that we will merit a continuance of the same.

Respectfully yours,
KOPPE BROS. & STEINICHEN,
Atlanta, Ga.



The Chateaus of France

HAVE at once a structural, historic, picturesque and artistic interest which is not surpassed by any architecture the world has known. They form the highest exemplification of stone architecture. Nearly all of the chateaus of France are of stone. For beauty of detail and for ready adaptability of modern decorative requirements, no better examples are to be found.

With the February number of *STONE* we shall begin the publication of a series of profusely illustrated articles on these chateaus. Most of the material will be derived from the work of Emanuel Violle-le-Duc, the well known French architect and author.

The Architects of America have never had this matter presented to them. Being, as it is, an architecture readily adapted to modern requirements, picturesque in outline, containing a mass of detail from the simplest to the most complex and elaborate, yet always in good taste and extremely beautiful, it is surprising that it has never been brought to their attention.

To the Stone Workers, we can say that this series of articles will contain a description and illustration of the most beautiful and generally satisfactory stone work that is known in the history of the world. The cuts are of a highly practical character, presenting very clearly methods, forms of construction, details of ornament, and descriptive suggestions of an exceedingly wide range.

This matter is prepared by Mr. Louis H. Gibson, architect, with the help of Mrs. Gibson as translator, who have visited nearly all of the chateaus now in existence in France, and whose long residence in that country enables them, with the aid of other material, to present a highly practical and picturesque collection of material.

STONE is a magazine of 148 pages, after the style of *The Century*, *Scribners*, et al. The subscription price is \$2.00 a year.

NOTE.—You can order *STONE* sent you and pay for it any time within a year. Every number contains matter of interest to architects.

THE D. H. RANCK PUB. CO.,
INDIANAPOLIS, IND.

THE Sulzer-Vogt Machine Co., Louisville, Ky., are builders of improved hydraulic belt and hand power passenger and freight elevators. They being the largest builders in the South, have the best facilities and latest improved machinery for doing work in their line. Any one contemplating putting in an elevator will do well to write them for estimates. They refer in their catalogue, which can be had on application, to numbers of machines which have been doing satisfactory work in Kentucky, Louisiana, Tennessee, Texas, Virginia, Alabama, Arkansas, Georgia and Indiana.

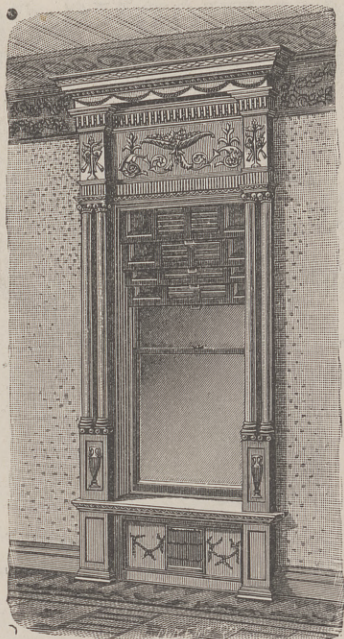
NEW COUNTY BUILDINGS.

April 13th next the citizens of Atlanta and Fulton county will vote on the issuing of bonds to the amount of six hundred thousand dollars for the building of a new jail and a new court-house. The new buildings are to be extensive in size, supplied with all modern improvements and models of architectural excellence.

The Freeman Lumber Co., of Dallas, Texas, incorporated to manufacture lumber and shingles; capital stock \$50,000.

The Mitchell & O'Hare Hardware Co., of Maysville, Ky., incorporated with \$20,000 capital.

The Union Furniture Co., of Gadsden, Ala., organized with \$10,000 capital, will start factory.



Inside Blinds and Screens.

THE Willer

SECTIONAL SLIDING BLINDS,
PATENT FOLDING BLINDS,
REGULAR FOLDING BLINDS,
WINDOW SCREENS and
SCREEN DOORS.

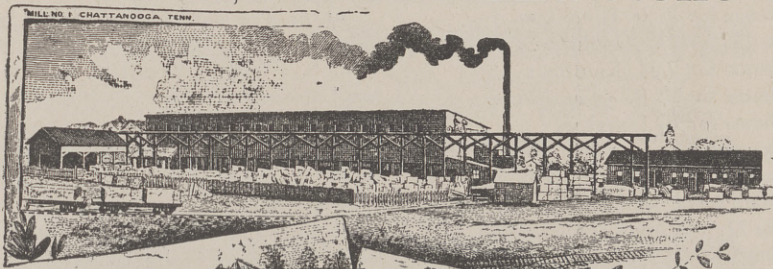
CATALOGUE A.—
Pocket Edition. Free.
CATALOGUE B.—
Window Screen and Screen Door
Edition. Free.
CATALOGUE C.—
Architects' and Builders' Edition.
50 Cents.

Willer Manufacturing Co.,

MILWAUKEE, WIS.

Send 16 cents in stamps for the Willer March, for the piano, dedicated to this Company by Director Chr. Bach.

Chattanooga Marble and Stone Co.



Contractors and Dealers and Quarrymen in all Kinds of
ROUGH SAWED AND DRESSED BUILDING STONE,
TENNESSEE MARBLE TILE AND WAINSCOTING.
CHATTANOOGA, TENN.

N. U. WALKER CLAY MANUFACTURING CO.

MANUFACTURERS OF

Sewer Pipe, Fire Brick,
Flue Linings, Chimney Tops, Fire Tile, Lawn Vases, Rustic Work, Etc.
And Dealers in **CEMENT, PLASTER, LIME, FIRE CLAY, Etc.**
NO. 142 THIRD STREET,
FRANK R. BURRELL, Manager. **LOUISVILLE, KY.**



Dow Wire Works Co.

LOUISVILLE, KY.

Elevator Enclosures of Wire
and Grille Work,
Window Guards, Bank Railings,
Cresting, Iron and Wire Fencing.

Catalogues and Quotations with
Pleasure.

ALBERT REMDE.

No. 2 West Third St., CINCINNATI, O.

ARCHITECTURAL ORNAMENTATION

In Wood, Metal, Clay or Plaster a Specialty.
Ornamental Pattern Maker Moulds.
Fancy Lettering for Name Plates and Signs.

Designer for the Trade.

ARCHITECTURAL WOOD CARVER.

London Art Putty Decoration.

STAINED GLASS **FOR CHURCHES AND DWELLINGS.**
Ecclesiastical and Domestic Figures, and
Memorial Windows.
Designs and Estimates Furnished on Application.
Wm. REITH.
134 N. 7th Street, PHILADELPHIA, PA.

Building Notes.

ALABAMA.

Montgomery.—R. N. McGrath, architect, has prepared plans which have been accepted for the following work:

Store building for H. M. Jones; cost \$1,700.

Store building for D. M. Snow; cost \$2,700.

Cottage for G. H. Lee; cost \$1,200.

Residence for A. Pelgree (South Perry); cost \$7,900.

ARKANSAS.

Pine Bluff.—Mr. E. Cook, architect, has prepared plans which have been accepted for two dwellings for R. Brenson; cost \$3,000.

Hotel for E. Miller; cost \$18,000.

FLORIDA.

Albion.—Geo. MacKay, architect, Ocala, has prepared plans which have been accepted for a phosphat plant for Albion Yshos Mining Co.; cost \$9,700.

Fernandina.—R. S. Schuyler, architect, has prepared plans for rebuilding the church recently burned, for St. Peter's Episcopal church; cost \$12,000.

Ocala.—Geo. MacKay, architect, has prepared plans which have been accepted for the following work:

Residence, for F. A. Teagus; cost \$6,500.

Residence for W. A. Hooker, O. L. Burdick, builder; cost \$4,000.

Residence for A. Wronker; Wm. Bull builder; cost \$3,200.

GEORGIA.

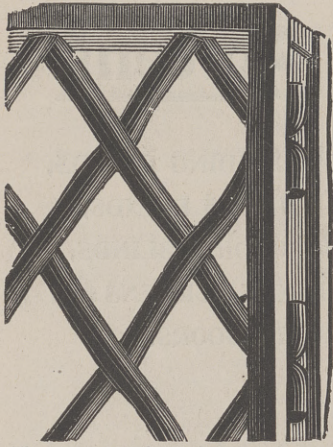
Macon.—D. B. Woodruff, architect, has prepared plans which have been accepted for remodeling First Presbyterian church; cost \$5,000.

Odd Fellows' hall for Odd Fellows; cost \$20,000.

Remodeling Masonic hall; cost \$5,000.

Dwelling for S. B. Price; cost \$4,000.

Manchester-Atlanta P. O.—D. P. Woodruff, architect, has prepared plans for an Odd Fellows' hall for the Odd Fellows; cost \$25,000.



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LOUISIANA.

Redwine.—A. S. Allen, architect, Shreveport, has prepared plans which have been accepted for school building for School Commissioners, Elliott & Russell, builders; cost \$3,000.

Shreveport.—A. S. Allen architect, has prepared plans which have been accepted for the following work from his office:

Residence for J. W. Soady, Jordon street; cost \$8,000.

Residence for Geo. A. Poleman, (Holmesville Subdivision); Peterson & Co., builders; cost \$2,000.

Residence for W. S. Penick, Jr., Cotton street; cost \$6,000.

Residence for Mrs. M. Agurs, Market street, cost \$2,000.

MISSISSIPPI.

Natchez.—W. K. Ketteringham, architect, has prepared plans which have been accepted for a residence for Rev. J. B. Stratton; cost \$7,000.

Residence for Mrs. Drake; cost \$3,000.

OHIO.

Cincinnati.—Gustave Drach, architect, has prepared plans which have been accepted for a residence for S. W. Goodman; cost \$6,000.

Warehouse for Henry Hanna; Wm. H. Stewart & Sons, builders; cost \$20,000.

Cleveland.—S. R. Badgely, architect, has prepared plans for a bank and office building; cost \$45,000.

Mt. Vernon.—S. R. Badgely, architect, Cleveland, has prepared plans for a church building for First M. E. Church; cost \$20,000.

TEXAS.

Dallas.—J. E. Flanders, architect, has prepared plans which have been accepted for a school building for city of Dallas; cost \$20,000.

Fort Worth.—A court house to cost not less than \$300,000 nor more than \$400,000; A. B. Bristol & Son, architects, Dallas.

Galveston.—C. W. Bugar, architect, has prepared plans which have been accepted for a residence for Will Eichlitz; Booth & Jackson, builders; cost \$3,500.

Residence for E. F. Harris; Booth & Jackson, builders; cost \$3,500.

Residence for J. L. Compton, O and 23d street; cost \$4,000.

Residence for Mrs. McCullough, Church and 20th street; cost \$3,000.

VIRGINIA.

Richmond.—M. J. Dimmock, architect, has prepared plans which have been accepted for the following work from his office:

Residence for W. T. Whitehurst; T. Wiley Davis, builder; cost \$12,000.

Residence for E. D. Hotchkiss.

Residence for Ike Kaufman.

Residence for I. H. Kaufman.

Residence for B. B. Valentine.

Residence for B. Lorraine.

Residence for Henry Valentine.

C. Ruehrmund, architect, has prepared plan, which have been accepted, for a residence for M. Thalimer; cost \$10,000.

Residence for F. Fourqueson; cost \$3,000.

P. J. White, architect, has prepared plans which have been accepted for three dwellings for Demon, Tupper & Co.; J. J. Dickinson & Bro., builders; cost \$12,000.

Dwelling for P. J. White; cost \$6,000.

Four dwellings for Samuel P. Royal; cost \$8,000.

Store and dwelling for A. Feitig; cost \$5,000.

From Supplement, March 1st.

ALABAMA.

Mobile.—Messrs. Jas. F. & C. L. Hutchisson, architects, have prepared plans which have been accepted for a frame cottage for F. W. Carmelich; M. H. Saville, builder; cost \$2,000.

Two brick dwellings for Mrs. M. Hamilton; T. M. Maddin & Co., builders; cost \$3,000.

Two frame dwellings for W. D. McKins-try; J. P. Emrich & Son, builders; cost \$3,500.

Two frame dwellings for Trinity church rectory; cost \$3,500.

FLORIDA.

A. S. Eichberg, architect, Savannah, Ga., has prepared plans for a board of trade building for Board of Trade.

GEORGIA.

Savannah.—A. S. Eichberg, architect, has prepared plans which have been accepted for remodeling a store for B. H. Levy & Bro. Parsonage for Trinity church.

Atlanta.—Messrs. Golucke & Stewart, architects, have prepared plans which have been accepted, for a residence for Dr. Geo. Payne, West Peachtree street; cost \$6,000.

Residence for Mrs. E. Wilson, Irwin street; cost \$4,000.

E. G. Lind, architect, has prepared plans for two additional stories to building of Grant & Kirkpatrick.

Two double tenement houses for J. C. Kirkpatrick, Baker street; cost \$20,000.

Dwelling for Mrs. P. H. Snook, Courtland avenue; cost \$3,500.

Addition to a church for M. E. Church, Boulevard; cost \$2,000.

G. L. Norrman, architect, has let contract for the John Silvey building; Messrs. M. T. Lewman & Co., contractors. Has let contract for marble front to Merchants Bank building; Messrs. Bense & Co., contractors.

Augusta.—The contract for the grand White building has been given out to Jesse Thompson & Co. The plans were drawn by Architect Lewis F. Goodrich. The building will cost \$60,000. It will be seven stories high, and have a floor area of 113,410 square feet, covering nearly three acres. This will make the biggest store building in the South. The first four stories will run through to Ellis street, and be of Cumberland buff stone. The three top stories will run half way back to Ellis street and will be of buff brick, stone and iron. The front will be sixty-nine feet and the depth 266 feet. It will be 140 feet to the top of the building.

Washington.—G. L. Norrman, architect, Atlanta, has prepared plans which have been accepted for a residence for J. R. Dyson.

INDIAN TERRITORY.

Ardmore.—Messrs. A. B. Bristol & Son, architects, Dallas, have made plans which have been accepted for a store building for Messrs. Rines & Scivally; cost \$4,500.

KENTUCKY.

Louisville.—Messrs. Drach & Thomas, architects, have prepared plans which have been accepted for a block of residences for Home Investment Co.; cost \$40,000.

Residence for Wm. Lyons, First and Burnett streets; cost \$6,000.

Residence for J. B. Pirtle, First and Oak streets; cost \$5,500.

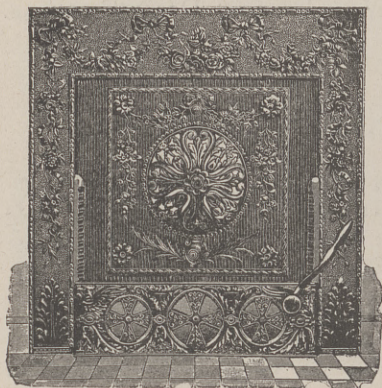
Residence for Mrs. Tus. Meyers, Third avenue; cost \$6,300.

Store and flats for John T. McCauley, Walnut and Fourth streets; cost \$15,000.

Warehouse for American Tobacco Co., Broadway and Eighteenth street; cost \$50,000.

Oakdale.—Messrs. Drach & Thomas, architects, Louisville, have prepared plans which have been accepted for a residence for Wm. Porter; cost \$9,000.

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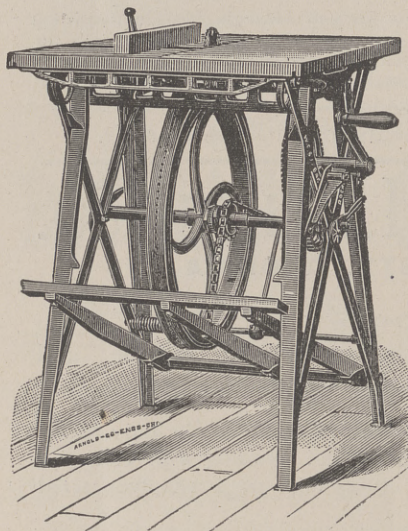
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LOUISIANA.

Covington—A. W. Mass, architect, 76 Baronne street, New Orleans, has prepared plans which have been accepted for a residence for Col. Jos. Hernandez; cost \$7,000.

New Orleans.—Southern R. Duval, architect, has prepared plans for the following work from his office, which has been accepted:

Residence for T. T. Raymond; Chas. A. Favrot, builder; cost \$5,000.

Residence for W. E. Raymond; Chas. A. Favrot, builder; cost \$5,000.

Residence for G. C. Mott; cost \$6,500.

Residence for G. B. Penrose; cost \$7,000.

Residence for P. R. Rice; cost \$15,000.

Alteration to Pickwick Club; Chas. Garvey, builder; cost \$8,000.

Alteration to store for M. Pokorny; Alex. Hulm & Tom Carey, builders; cost \$4,000.

Residence for Isadore Scooler; J. H. Rolf, builder; cost \$6,000.

A. W. Maas, architect, has prepared plans which have been accepted for repairs to U. S. custom house for U. S.; cost \$6,400.

Residence for repairs for Mrs. J. Burbank; Messrs. Williams Bros., architects; cost \$3,000.

MARYLAND.

Baltimore.—Ben. B. Owens, architect, sends us the following, for which plans have been prepared and accepted:

Warehouse for trustees of Hopkins Hospital; Geo. Archer, architect; John Haswell & Son, builders; cost \$125,000.

Three three story brick buildings for Patrick Reddington.

MISSOURI.

St. Louis.—C. E. Illsley, architect, reports the following, for which permits have been applied for:

Two two story brick dwellings for C. Terry; J. L. Drake, builder; cost \$6,000.

Two story brick dwellings for L. Birken; C. Kamp Schulthiss, builder; cost \$2,500.

Two three story brick dwellings for F. W. Meyer; J. Voke, builder; cost \$6,000.

Two story brick dwelling for F. Lawler; Hassinger & Rupp, builders; cost \$2,800.

Two two story brick dwellings for E. Voorhauer; G. Kohlmuller, builder; cost \$6,800.

Two two story brick dwellings for M. Aulthaus; Neur & Meng, builders; cost \$5,000.

Two and a half story brick dwelling for Geo. Bothe; Bothe & Raterman, builders; cost \$4,500.

Two two story brick dwellings for J. Knoth; Abraham & Co., builders; cost \$5,000.

Two story brick dwelling for H. Bridgewater; Abraham & Co., builders; cost \$3,400.

Two story brick dwelling for George Graper; F. Dengler, builder; cost \$2,600.

Two three story brick dwellings for Geo. Gellner; Buis & Stoff, builders; cost \$6,400.

Two two and a half story brick dwellings for Aug. Kuiper; William Klute, builder; cost \$5,900.

Two and a half story brick store and dwelling for M. Maher; J. D. Cregan, builder; cost \$4,000.

Two story brick dwelling for Self; E. Q. Gate, builder; cost \$3,500.

Two two and a half story brick stores and dwellings for H. Foer Steling; A. Frankenstein, builder; cost \$3,000.

Two story brick store and office for H. B. Scannell; Grove & Murry, builders; cost \$5,000.

Five two story brick stores for D. F. Addinger; cost 40,000.

Two story brick machine shop for Lindell R. R. Co.; Illtner & Spore, builders; cost \$11,700.

One story brick warehouse for St. Louis Sash Co.; J. Waldinwon, builder; cost \$3,000.

Three story brick warehouse for J. J. Long; M. Scanlon, builder; cost \$9,000.

Two story brick addition to dwelling for A. E. Brueker; J. W. Barnes, builder; cost \$2,500.

Two two story brick dwellings for self; J. Dwyre, builder; cost \$12,000.

Twenty-one two story brick dwellings for B. Styermark; P. Mulcahy, builder; cost \$6,000.

Six two story brick dwellings for Geo. Bente; J. Anger, builder; cost \$22,000.

Two story brick dwelling for J. McFrancism; H. Loyd, builder; cost \$5,000.

Twenty-one two story brick dwellings for P. P. Green; J. Tierney, builder; cost \$10,000.

Eight two story brick dwellings for P. P. Green; J. Tierney, builder; cost \$48,000.

Two story brick dwelling for self; H. A. Nagel, builder; cost \$3,000.

Two story brick dwelling for Mrs. A. Harenpoth; B. Massler, builder; cost \$3,000.

Two story brick dwelling for G. Koph; B. Massler, builder; cost, \$2,500.

Two three story brick dwellings for Robt. Frichert; Dunn Bros., builders; cost \$7,000.

Two two story brick dwellings for self; J. Duket, builder; cost \$6,000.

Two two story brick dwellings for L. Vrana; Zwicky & Pruct, builders; cost \$5,400.

Two story brick dwelling for F. Coy; H. Ellerman, builder; cost \$2,500.

Two story brick dwelling for G. Eschenbrennan; G. M. Roeder, builder; cost \$5,200.

Two story brick dwelling for L. Walrke; E. Erdmegger, builder; cost \$6,000.

Two story brick dwelling for self; W. H. Franz, builder; cost \$4,500.

Two story brick dwelling for self; M. Mathews, builder; cost \$4,500.

Two story brick dwelling for R. Manski; F. Mueller, builder; cost \$3,500.

Two story brick dwelling for H. Minalb; Herman & Hoff, builders; cost \$4,000.

Two story brick factory and dwelling for H. Ackerman; Schroeder & Roser, builders; cost \$8,000.

Two story brick warehouse for J. G. Hoss & Co.; E. Wind, builder; cost \$11,500.

Two story factory for Liouice & Carolonians Co.; W. A. Miller, builder; cost \$7,000.

Two story brick addition to factory of C. M. Seamans; cost \$3,000.

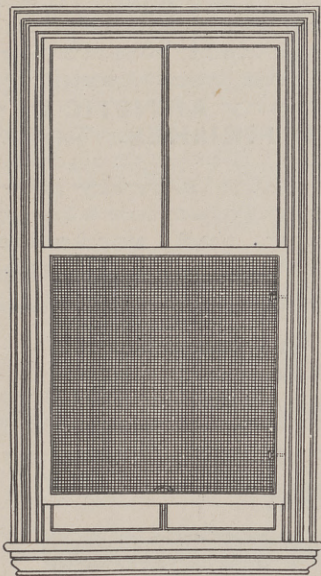
Brick alterations for M. M. Buck; R. P. McClure; cost \$17,000.

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SOUTH CAROLINA.

Darlington.—Messrs. Wilson & Huggins, architects, Roanoke, Va., have prepared plans for a residence for John S. Burch; cost \$2,500.

TENNESSEE.

Chattanooga.—S. M. Patton, architect, has prepared plans which have been accepted for a residence for Capt. C. A. Lyerly; Adams & Schneider, builders; cost \$10,000.

Residence for Dr. G. R. West; Adams & Schneider, builders; cost \$6,000.

Double residence for Bond & Janes; cost \$10,000.

Residence for N. E. Baker; N. C. Hulse, builder; cost \$7,000.

Knickerbocker residence for B. F. Rees; D. J. Chandler, builder; cost \$15,000.

Store and offices for T. H. McCallie; Breeding & Hopkins, architects; Harper & Manes, builders; cost \$9,000.

Store for Richmond & Smartt; Hunt & Lamb, architects; Parks & Hunt, builders; cost \$4,000.

Nashville.—Robert Sharp, architect, has prepared plans which have been accepted for a residence for Edward Baxter; cost \$10,000.

TEXAS.

Hillsboro.—Messrs. A. B. Bristol & Son, architects, Dallas, have prepared plans which have been accepted for a church building for the M. E. Church; Bobb & Eblen, builders; cost \$11,000.

McKinney.—Mr. Smith, architect, has

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prepared plans which have been accepted for a church building; cost \$5,000.

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St. Joe.—Messrs. A. B. Bristol & Co., architects, Dallas, have prepared plans which have been accepted for a school building for city; J. H. Mauldin, builder; cost \$7,500.

San Antonio.—Messrs. Frankel & Hayden, architects, have prepared plans which have been accepted for a residence for Mrs. Carrier; cost \$2,500.

Messrs. McAdoo & Wooley, architects, have prepared plans which have been accepted for a stone and brick stable for T. E. Adams; Messrs. Crow & Drake, builders; cost \$3,000.

Brick store for W. W. King; H. F. Rennsberg, builder; cost \$3,600.

Frame residence for Wm. Hill; Jos. Shepherd, builder; cost \$2,500.

Uvalde.—Messrs. Frankel & Hayden, architects, San Antonio, have prepared plans which have been accepted for a church building; cost \$3,000.

VIRGINIA.

Roanoke.—Messrs. Wilson & Huggins, architects, have prepared plans which have been accepted for alterations in residence of Andrew Lewis; cost \$2,000.

Three residences for G. H. Coon; A. L. Marshall, builder; cost \$6,000.

WEST VIRGINIA.

Wheeling.—M. F. Geisey, architect, has prepared plans which have been accepted for a six story building for F. H. Lange; cost about \$50,000.

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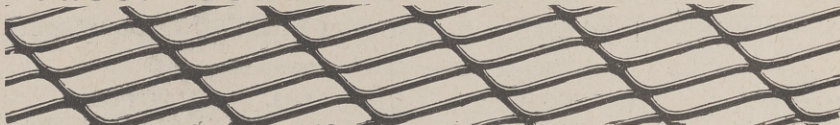
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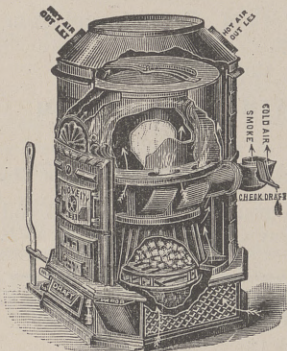
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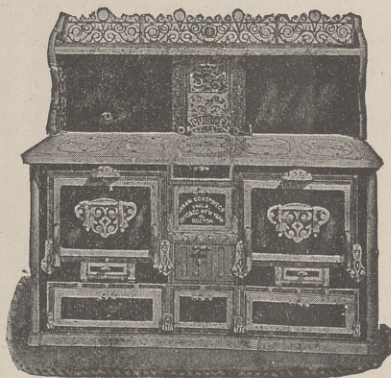
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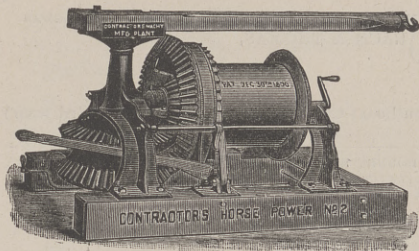
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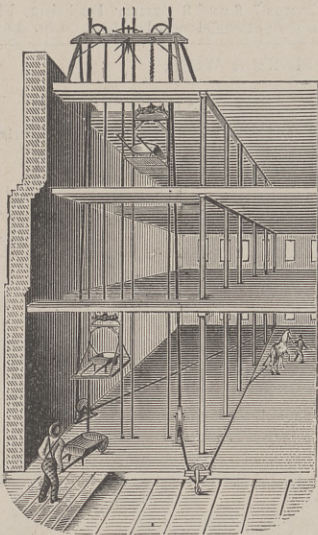
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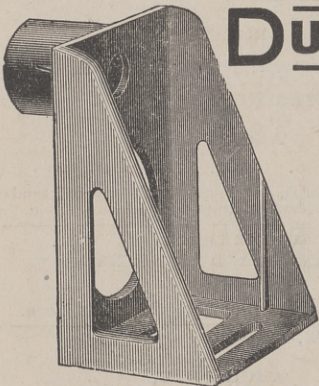
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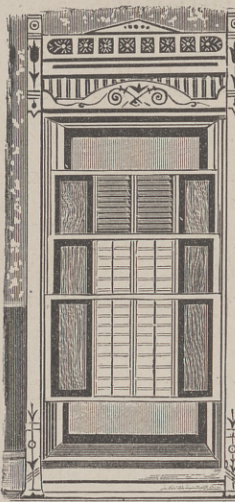
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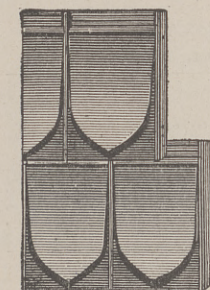
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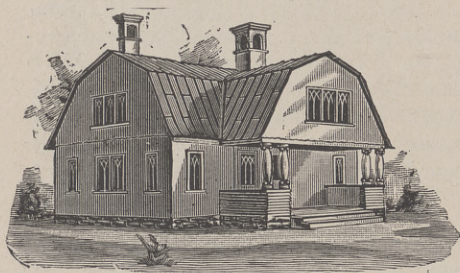
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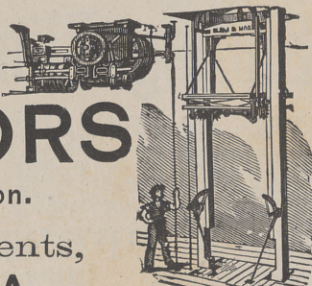
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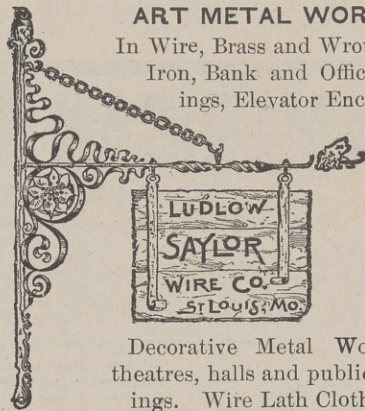
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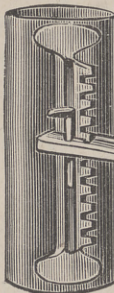
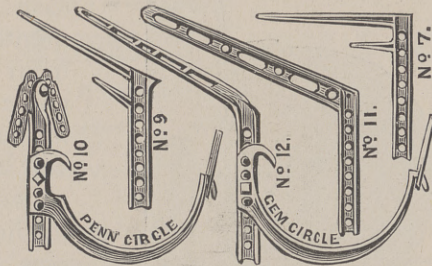
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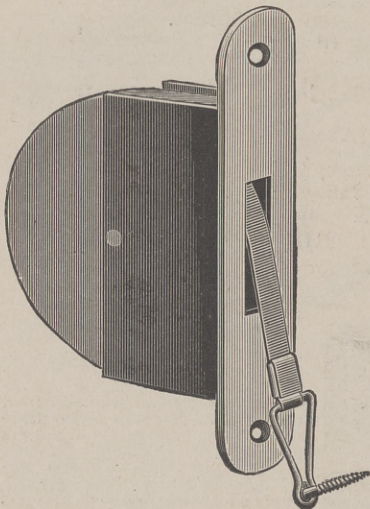
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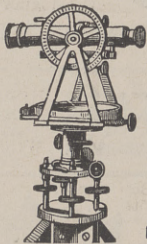
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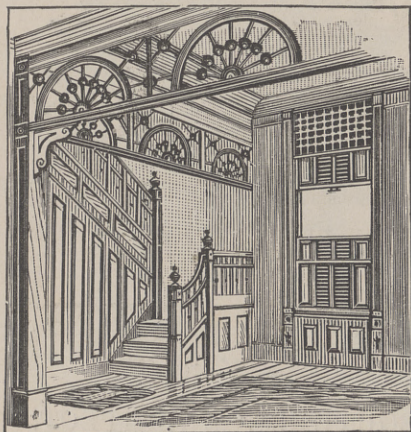
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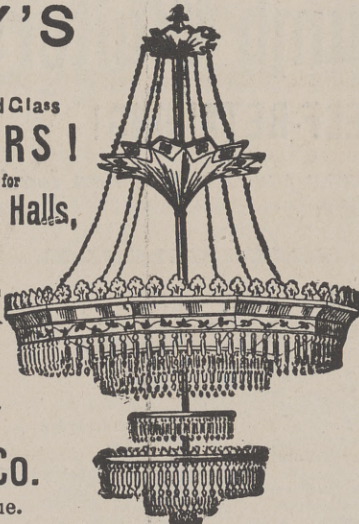
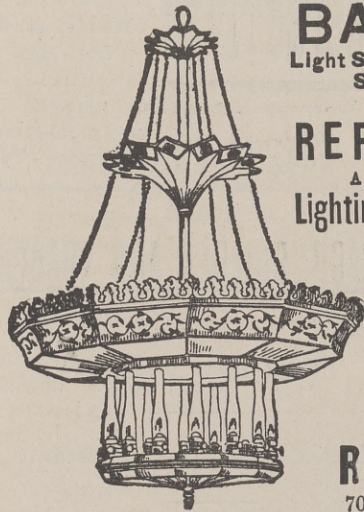
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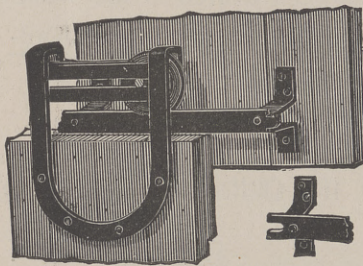
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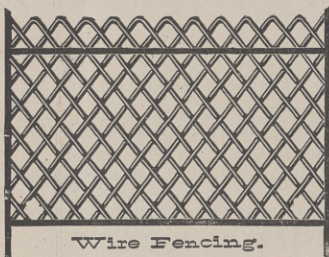
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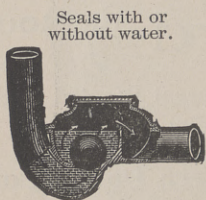
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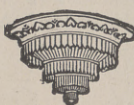


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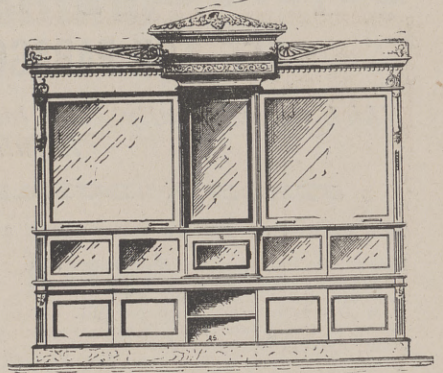
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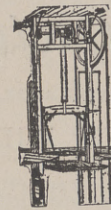
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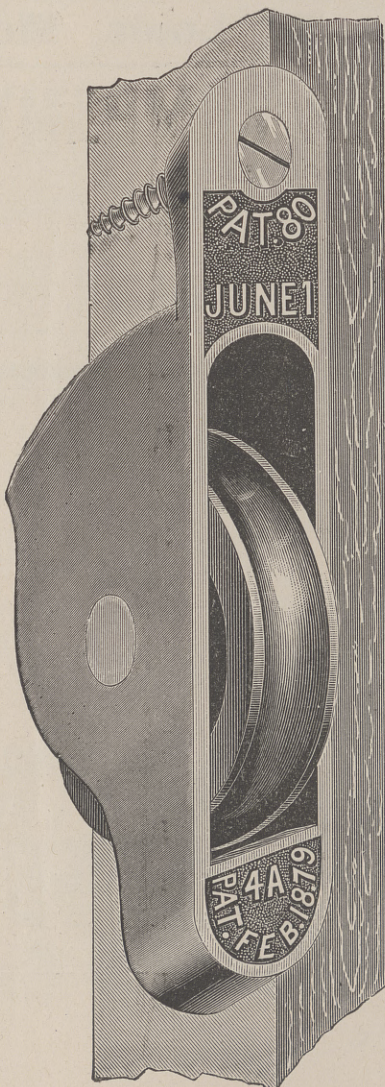
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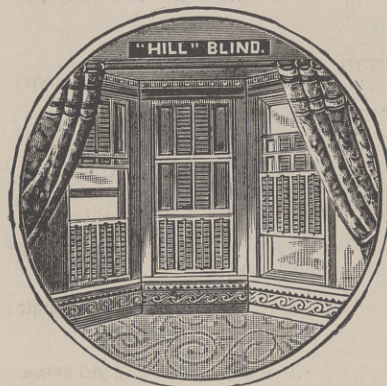
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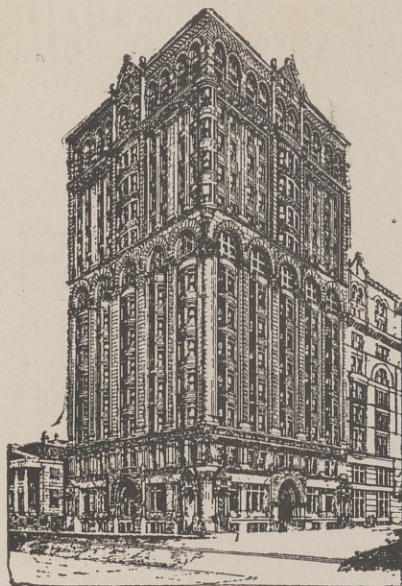
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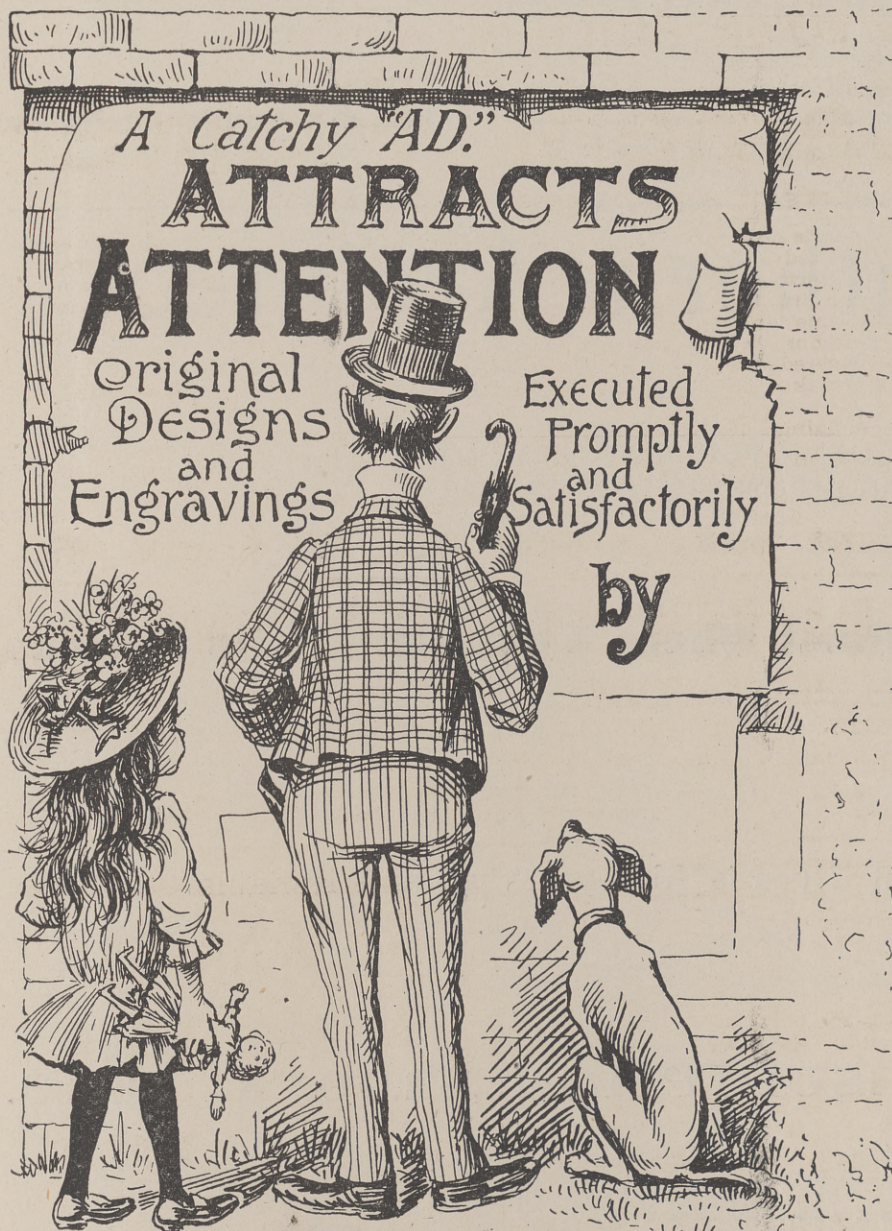
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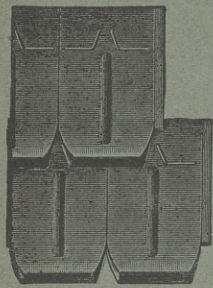
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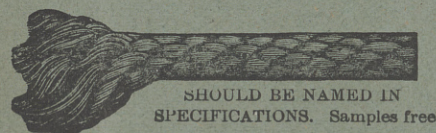
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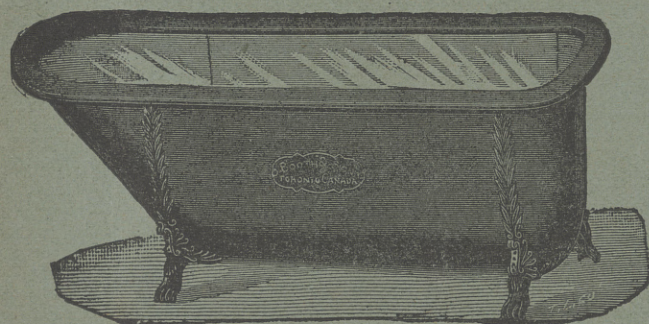
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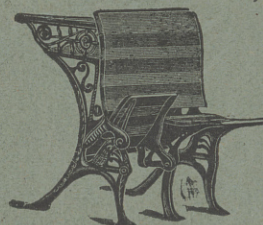
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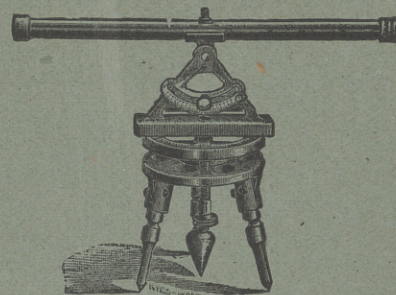
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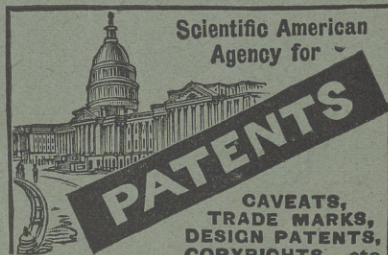


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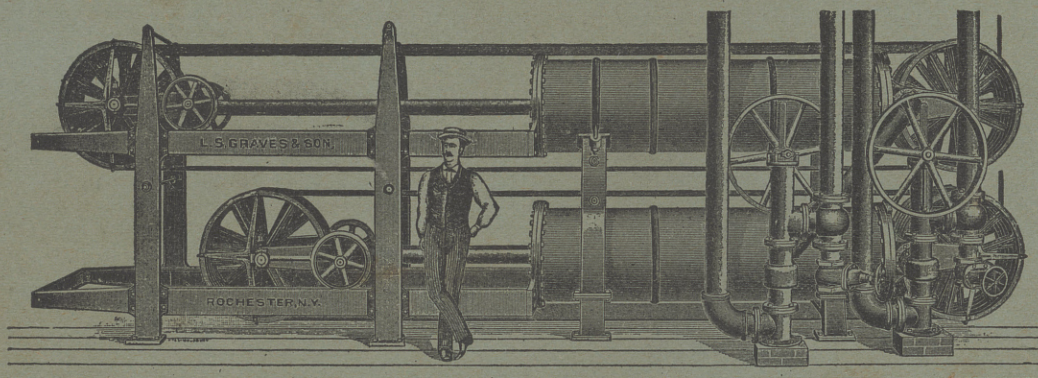
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