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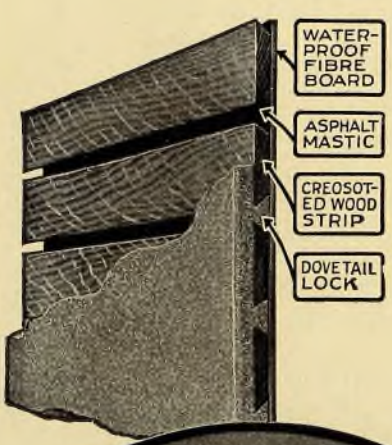

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A Little Nonsense Now and Then Indulged in by Some Business Men

A Certain Man fell ill. So he went to his physician and said: "Doctor, I am suffering acutely from **hepatitis** and I wish you to write me a prescription calling for eight half-grain tablets of mercurous chloride, which I wish to take every ten minutes until I have taken them all. And, while you are writing the prescription, I will borrow your instruments and test my blood pressure, heart action and temperature."

Having made the tests and satisfied himself that the prescription was adequate, the Man proceeded on his way, but remembered that he had business with his Attorney. So he betook himself to the office of his Counsel, and, on being admitted, said: "Mr. Brown, I wish you to take charge of this libel proceeding which one of my neighbors has started because I called him an 'Ignorant Idealist' in a letter to the **Sun.** I wish you to prepare the proper pleadings. We will file a general demurrer which you will have set down for argument next Tuesday morning at 10 o'clock, and if we are not sustained we will admit and justify and go ahead to prove that Smith **is** an 'Ignorant Idealist.' "

And having concluded, thus, his business with his Counsel, the Man remembered that he must see his Architect. So he called on his Architect to explain that he desired to erect a Building. And just as he was about to draw from his inside pocket a complete set of plans and specifications, with various elevations, with every question of design, material and workmanship settled—

But it occurs to the teller of this tale that most of it never happened. Instead, the Man was quietly but firmly removed from his doctor's office and in an ambulance conveyed to a Sanitarium devoted to the repair of Fractured Mentalities, which accounts for the fact that he was not able to visit his Dentist for the purpose of delivering instructions with reference to the placing of an inlay in a second molar, nor did he get to the office of his Oculist to arrange for the prescribing of a pair of minus spheres he had decided on as likely to remedy the presbyopiatic condition of his eyes.

Now this, of course, is all nonsense. And yet it is not altogether nonsense either, for there are many people who really believe that they are pursuing logical and proper methods in marketing products used in building by endeavoring to induce clients to tell Architects what to use and how to use it. Of course, no such procedure would suggest itself to any manufacturer whose product's use depended altogether on the decision of a physician or a lawyer.

The real nonsense lies in the belief that Advertising to Consumers will compel Architects to specify materials in which their confidence has not been established.

Talks on Advertising—IV
by
THE AMERICAN ARCHITECT

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Contents

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DETAIL FROM THE MONUMENT OF DOGE ANDREA VENDRAMIN
CHURCH OF SS. GIOVANNI E PAULO, VENICE

THE AMERICAN ARCHITECT

VOL. CXVI WEDNESDAY, JULY 30, 1919 NUMBER 2275

The Wallace Clement Sabine Laboratory of Acoustics, Geneva, Ill.

By PAUL E. SABINE

THIS Laboratory was built for the researches of the late Professor Wallace C. Sabine, by his friend, Colonel George Fabyan. It is located at Riverbank, one mile from the little city of Geneva, Illinois, thirty-seven miles west of Chicago. The building is a three-story structure, of massive concrete and brick construction. Because of the purpose for which it was built, it possesses a number of special architectural features of sufficiently general interest to justify a description in the columns of THE AMERICAN ARCHITECT. It embodies the ideas of Professor Sabine for a building in which all sound from one portion can be completely excluded from another portion, excepting as it passes through a wall whose transmission is being studied. The securing of this condition is exceedingly difficult. The working out of these ideas is due to the keen personal interest of Colonel Fabyan, and the skillful and ingenious care of Mr. B. E. Eisenhour.

Essentially the building consists of two entirely separate structures under a single roof. The inner room or sound chamber is completely insulated from the outer so far as sound transmission is concerned. The arrangement is shown in plan, Fig. 1, and in section, Fig. 2. Those familiar with the earlier work of Professor Sabine on sound insulation will recognize the arrangement to have been suggested by that of the Constant Temperature room of the Jefferson Physical Laboratory at Harvard University.

The features of particular interest are the Sound Chamber, in which the original intensity of the sound is measured, the three Test Chambers, in which the intensity after transmission through a given wall surface is measured, and the sound

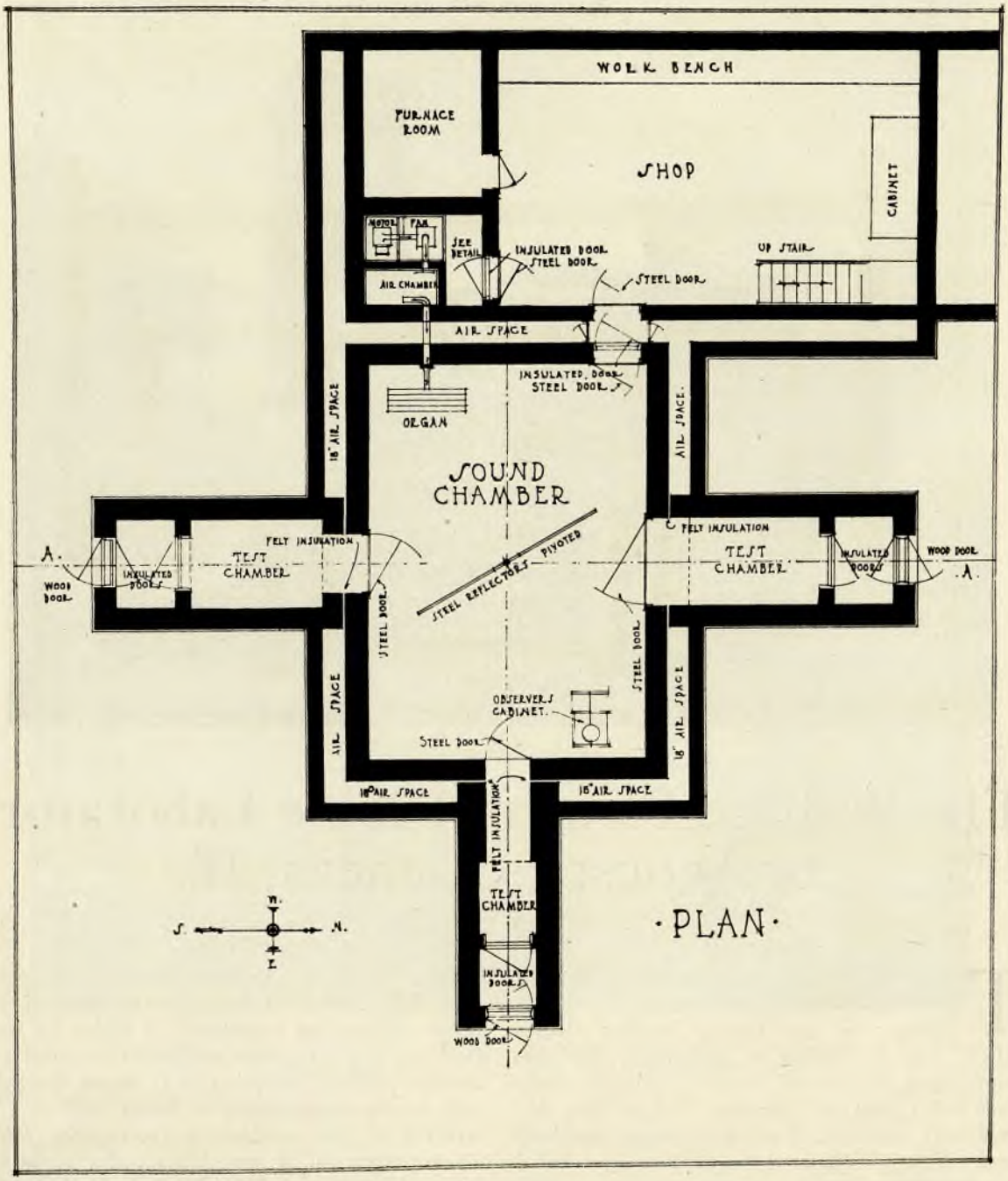


FIGURE 1

proofing of these rooms from each other and from outside noises. The other portions of the building contain laboratory and office rooms and possess no distinctive features requiring detailed description.

The Sound Chamber is a rectangular room 27′ x 19′ x 19′—9¾″. The walls are of brick 18″ thick, coated externally with cement, and on the inner surface with wood fiber plaster. It is built upon an entirely separate foundation, the details of which are shown in Fig. 3. It extends in elevation from the basement floor level to the level of the second floor of the outer structure. It

The source of sound is a complete organ of seventy-three pipes, giving all the tones of the musical scale from C, 64 vibrations per second to C, 4096 vibrations per second. These pipes were specially made so as to give pure tones as free as possible from upper partial tones.

The organ is operated electrically by the observer seated in a wooden cabinet. The observations are made with a timer, by which the source of sound is stopped and a stop-watch is started at the same instant. The watch is stopped by the observer at the instant the sound becomes inaudible. The organ

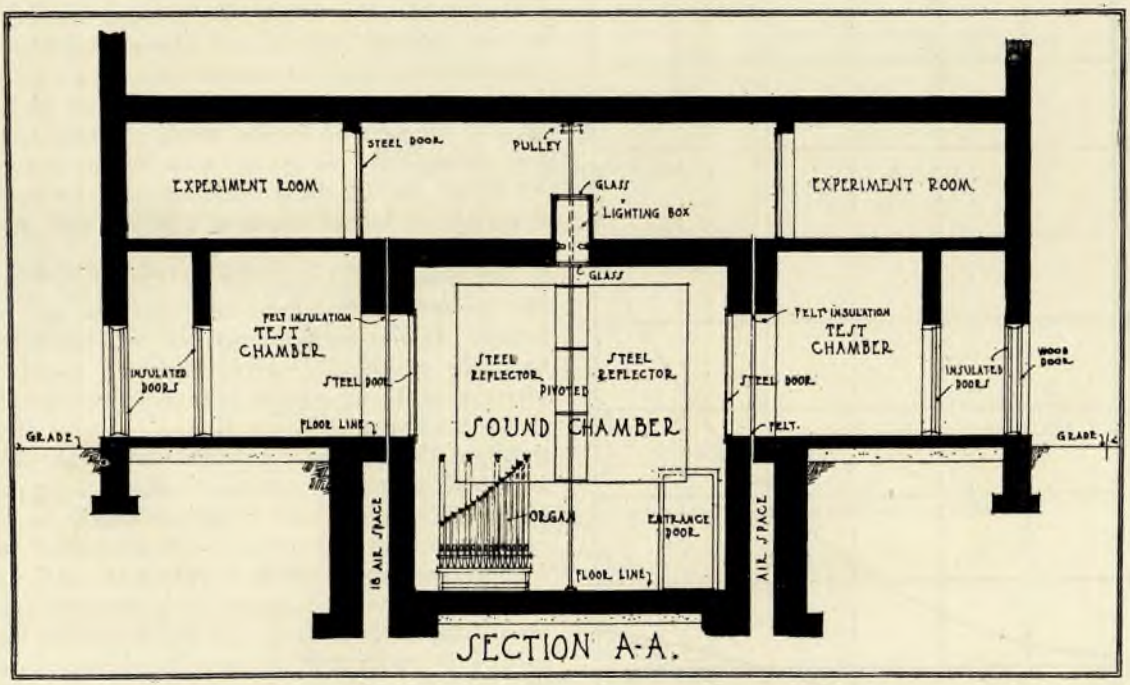


FIGURE 2

has four openings, an entrance doorway on the basement floor level, and three openings at the ground floor level into each of the three Test Chambers respectively. The entrance doorway is closed by a triple door, the two outer of heavy steel and the middle one being a heavy ice box door. This construction completely excludes sound through this doorway.

Except when the transmission tests are being made, all openings into the Sound Chamber are closed with heavy steel doors. With these all closed, the Sound Chamber thus becomes a room of constant acoustical properties, a condition highly desirable during an extended series of investigations, since control experiments need to be made from time to time to insure the constancy of conditions.

can be operated in the same way from each of the Test Chambers.

The large steel reflectors mounted on a shaft at the center of the room revolve noiselessly constantly changing the interference system and giving a uniform distribution of sound intensity throughout the room.

The method of observation consists of measuring simultaneously the duration, after the source has ceased, of the residual sound in the Sound Chamber, and in the Test Chamber, the two being separated by the wall structure, whose transmission is being tested. It is plainly essential that no sound should enter the Test Chamber save through this wall. Possible transmission from room to room by a common floor construction makes it necessary that the two rooms be separated clear to the foun-

dation. Reference to the section, Fig. 2, shows the construction by which this condition is secured. The layer of felt between the two adjoining walls serves to exclude sound from other parts of the building, rather than to insulate Sound Chamber from Test Chamber. Experience has shown that for this latter purpose an air space would be more effective than the felt.

The walls of the Test Chambers are of solid masonry 18" thick. Each chamber is entered by means of a small vestibule having two sound-proof

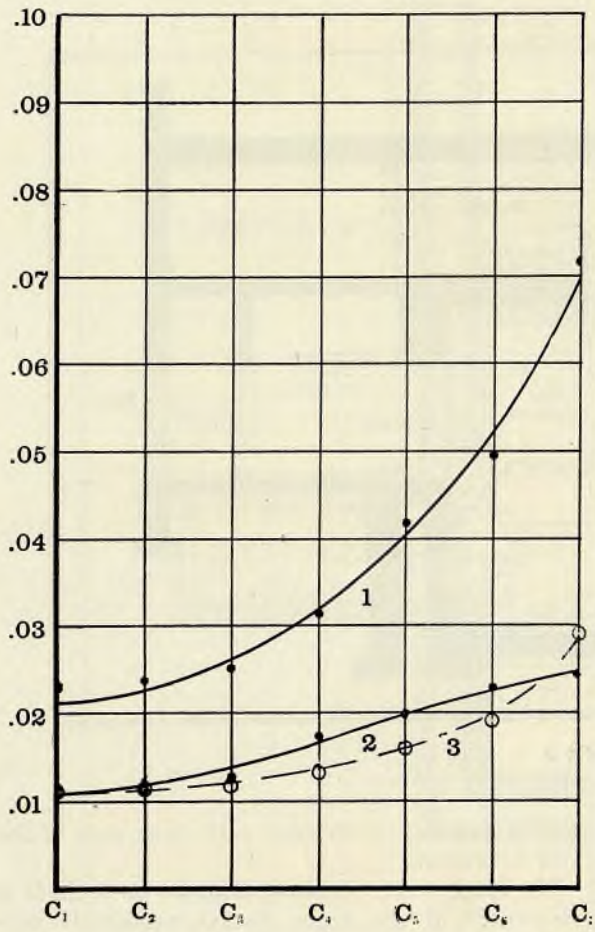


FIGURE 3

doors which prevent noises from out of doors entering the Test Chamber itself. The foundation of the Sound Chamber, consisting of successive layers of concrete, tarred paper, concrete, tile and sand serves to prevent transmission by way of the earth and walls from Sound Chamber to Test Rooms.

The problem of keeping the noise of the motor and blower for the organ from the Sound Chamber and Test Chambers had also to be solved. It is to be said that success in this direction was attained only after considerable experimentation. The final result, however, is a very satisfactory case of complete sound insulation. The distance from blower and its motor, necessarily somewhat noisy, to the Sound Chamber is only some six feet, but the noise is entirely inaudible in the Sound Chamber. Reference is made once more to detail drawings Figs. 3 and 4. Sound might be transmitted from the machinery into the Sound Chamber by several routes; by conduction along the walls of the air ducts, by way of floor and ground, or finally by means of the air itself. To prevent transmission by the first means, flexible connections are introduced in the ducts. To prevent transmission to the ground, motor and blower together are mounted on a separate foundation with an air cushion and layers of felt intervening so that no vibration is transmitted to the earth. Sound conduction through the air going to the organ is avoided by lining the air ducts with felt and by hanging a curtain of felt at the mouth of the duct leading from the bellows to the Air Chamber.

The acoustical properties of the Sound Chamber, so far as they have been studied, are interesting. As was early pointed out by Professor Sabine, the period of reverberation of sound of a given intensity in a room is inversely proportional to the absorption of its walls and directly proportional to the volume. In this case, large volume and small absorption combine to give a long period of reverberation. As a result, although the loudness of ordinary conversation is magnified many fold by the room, yet it is extremely difficult to understand sustained speech at a distance greater than three or four feet. At points on the longer axis of the room there is pronounced resonance for the tone C_3 256 vibrations per second. By way of comparison, the longest period of reverberation recorded for any room by Professor Sabine is 8.69 seconds. The period of reverberation for a sound of the same intensity and pitch in this room is about 12 seconds. As is plain, this very low absorption of the room itself makes its acoustical properties very sensitive to slight changes and increases correspondingly the precision with which measurements can be made.

The work in the laboratory so far has been by way of calibrating the Sound Chamber and the various instruments to be used in the continuation of the work.

Fortunately, calibration had been carried far enough by Professor Sabine to make it possible to proceed without repeating for the new conditions experiments which he performed years ago. Two sets of pipes whose rates of emission were determined by him only a few weeks before his death are

the basis of this calibration. Without this, work in the laboratory would have been delayed months, perhaps years.

The curve, Fig. 3, represents the absorption coefficient of wood fiber plaster on brick as determined in this laboratory for the range of tones indicated. On the same diagram are given the absorptions of painted and unpainted brick walls. (See Architectural Acoustics, Proceedings of American Academy of Science, 1906.) It will be seen that the shape of the curve for hard plaster very closely resembles that for unpainted brick, while the actual values, especially for the long waves of the low notes, agree with those for the painted brick. If the difference in absorption between painted and unpainted brick is due to porosity of the unpainted surface, then the curve for hard plaster because of its slightly porous character

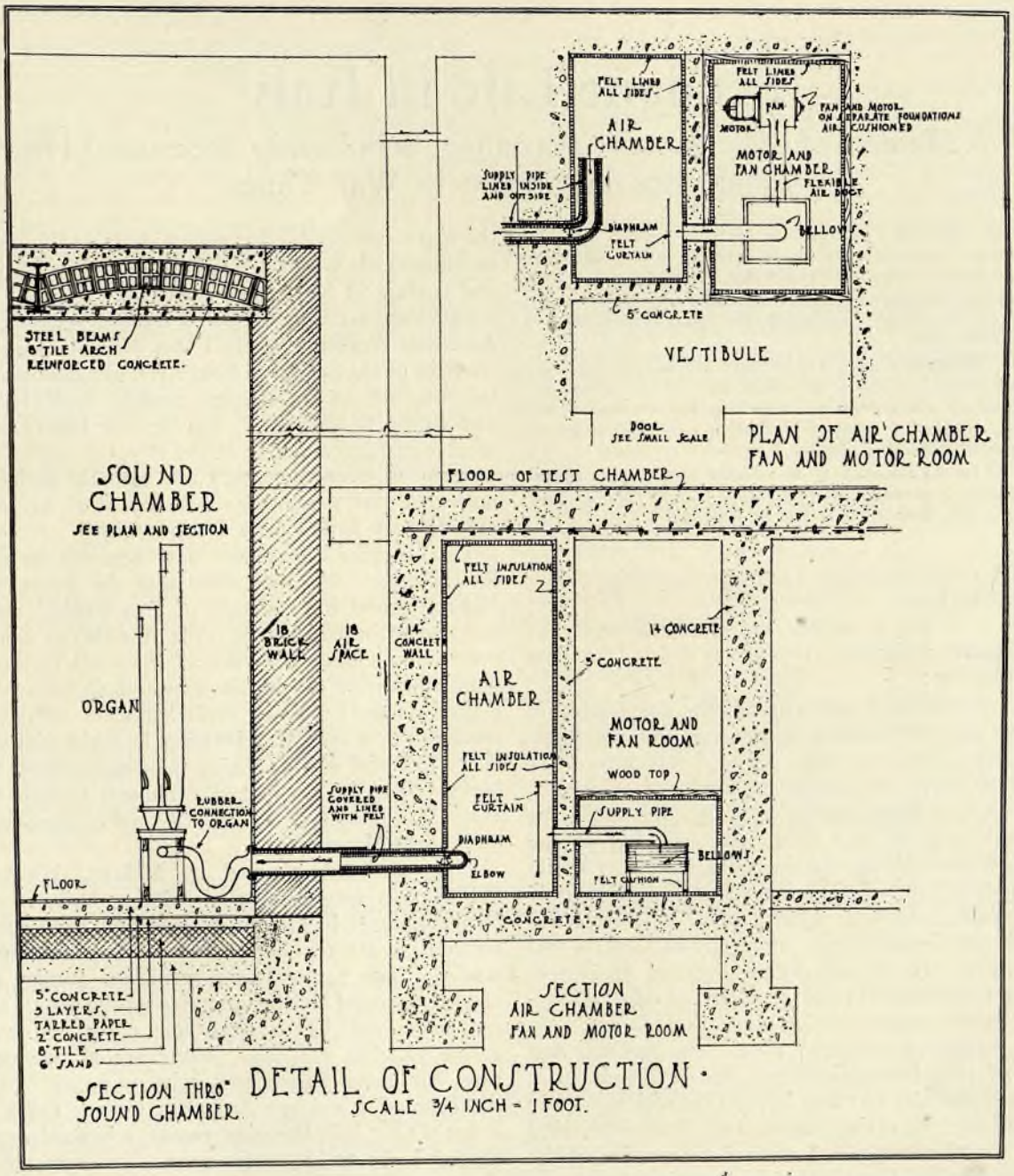


FIGURE 4

should resemble in shape that of unpainted brick, while the actual value of the absorption should be close to that for the painted surface.

These curves, taken in the course of the calibration, are presented as interesting evidence of the practical validity of this entire method of acoustical determination, based, as it is, upon the assumption that minimum audibility for different observers represents practically the same absolute sound intensity.

The laboratory is dedicated to the task of carrying out so far as possible the research program that Professor Sabine had laid out for its altogether admirable equipment. The laboratory staff will value most highly the interest of those architects to whom its purpose appeals, expressed either as inquiries or suggestions, regarding the practical aspects of problems in architectural acoustics with which they may be confronted.

Student Life in Italy

A Holder of The Rotch Travelling Scholarship Recounts His Experience in Europe in War Times

It is with much satisfaction that the editors of THE AMERICAN ARCHITECT *are by the courtesy of the committee of the Rotch Travelling Scholarship, permitted to print the following communication, or more properly speaking, report of Mr. Ralph Batchelder, the thirty-first holder of the Scholarship.*

Mr. Batchelder gives an intimate account of his work while in Italy. This is a recital that will be thoroughly enjoyed by every former scholarship winner, and it will clearly set forth to everyone just what a scholarship holder may avail himself of during his residence abroad.

It is in the intimacy of this recital that lies its charm. It is safe to assume that this report will be read with interest. Mr. Batchelder writes as follows:

TO the Committee for Rotch Travelling Scholarship:

I beg to submit the following report of my studies under the terms of the Rotch Travelling Scholarship:

As you know, I was awarded the Scholarship in May, 1914, but owing to the war did not begin my work until two years later. I left New York July 27, 1916, and landed in Bordeaux August 7. I went to Rome almost directly and spent the greater part of my time there studying at the American Academy. In the Spring of 1917 (April) I made a tour of three weeks in Southern Italy and Sicily, and later (June) made a tour of five weeks in Central Italy, principally in Umbria and Tuscany. These very interesting and instructive trips were made in the company of Mr. Witton, the other Rotch Scholar then abroad, and several American Academy men. The summer and fall of 1917 I spent in Rome, and in March, 1918, finding that the war was interfering with my study to an ever increasing extent, both from a physical and moral standpoint, I entered the service of the American Red Cross in Italy. I continued active in the Red Cross service for over a year, and returned to America via Genoa and Gibraltar, sailing April 4, and landing in New York April 18, 1919.

Upon my arrival in Rome I went at once to the American Academy where I met Mr. Stevens, the Director of the School of Fine Arts, was admitted to the Academy as an affiliated member, and given a fine studio to work in. Having my family with me I was obliged to live in the city, but found this no great inconvenience, as I was near the galleries, museums and monuments which it was my first object to see and become familiar with.

The American Academy now occupies its new location upon the Janiculum near the Porta San Pancrazio and the fountain of San Paolo. There are several buildings—the Villa Aurelia, so named because built upon a portion of the walls of Aurelian, which is an old and interesting building within a good garden; the two smaller modern villas and the large new Academy building in which the students live and work. These buildings occupy the highest land in Rome and command toward the east a magnificent view of the city and of the Sabine and Alban Mountains.

The Academy, planned by McKim, Mead & White, is a large and airy building built in the Renaissance style around a court and approached through a terrace in which are four sculptors' studios. The painters' and architects' studios occupy the second and third stories on the front, and are large, well lighted from the north and have a fine view of the city. There are accommodations for about 30 students, who enjoy all of the comforts of a modern American College, such as a fine dining hall, lounging rooms, a billiard room, shower baths and a tennis court. The only objection seems to be that it is too new and lacks the

atmosphere of the older and more interesting French Academy in the Villa Medici.

The library which occupies the ground floor of one wing, is a fine room and contains a good architectural library, and a better one as regards painting and classical studies. It is, however, an excellent place to read and browse around in, and it is expected that it will ultimately be greatly enlarged by bequests. It is pleasant in summer, but because of the war was not heated in winter, and consequently was too cold to use. It contains many of the standard works on architecture which are extremely useful to the student in Italy. Professor Van Buren, the librarian, is thoroughly familiar with it, and is always most willing to be of help. He prepared the inscription which I used on my drawing of the Portico of Octavia, and which he vouches for as the only correct one ever used on a restoration of this interesting monument.

The building of a train line past the door of the Academy has made it more accessible from the city, thus doing away with one of the chief objections to its location—the distance from the center of the city.

The opportunities for study at this Academy are good and are such as the serious student should avail himself of. In normal times, the social side of the Academy life is also pleasant and beneficial if not carried so far as to become a detriment to one's best work. The members of the Academy staff are always willing to be of assistance, and I am very grateful to the late Dr. Carter, Mr. Stevens, Mr. Lothrop, Professor Van Buren and others for their kindness to me. Although no teaching is attempted, there are numerous lectures, trips and tours to points of interest, some of which I mention below. It is also of great interest and value to students to see what others are doing, and this has been of benefit to me besides forming some warm personal friendships. The affiliated students live at the Academy practically on an equal footing with the regular students and enjoy the same privileges.

Almost immediately upon arriving in Rome I commenced a careful survey of the Renaissance monuments of the city using "Letarouilly" as a guide. Of course many of these have long since disappeared, but with the aid of Letarouilly's map and a modern guide to Rome, I was able to locate many of them, and I believe it was well worth the trouble. Naturally, being in residence in Rome for over two years, I became very familiar with its monuments, museums and galleries, and gained perhaps as much as if I could have travelled more. In respect to travel, I was fortunate to have been able, while holder of the M. I. T. Travelling Fellowship in 1909-10 to make extended tours in England, France, Italy, Switzerland, Germany, Holland and Belgium.

Being a member of the American Academy enabled me to profit by the many special lectures, trips, etc., conducted under its auspices. The most important of these were as follows:

(a) Dr. Carter—Three lectures in the Forum on "Roman Art and Civilization."

(b) Prof. Van Buren—Personally conducted trips near Rome (see below).

(c) Mr. Curtis—Lectures on Palatine and various museums.

(d) Mr. Lothrop—Lectures in various Churches in Rome; twelve lectures on Renaissance painting; trip to Umbria and Tuscany (see below).

(e) Prof. Van Buren, Curtis and Lothrop—Lectures in Naples and trips nearby (see below).

(f) Mr. Stevens—Villas and palaces in and near Rome.

I also assisted at a very exhaustive series of measurements of antique columns conducted by Mr. Stevens in Rome. These were made by means of extension ladders, painters' scaffolding, etc., by which wire was strung from top to base and measurements made every 2 feet to determine the entasis. The columns measured were:

1. Trajan's Column.
2. Temple of Neptune (now the Borea).
3. Portico of Octavia.
4. Colonnade in St. Peter's Square.

The work that I accomplished consisted of the following drawings:

	(Scale)	(Size)
1. Small Spada Palace — Façade	1/4"	22" x 28"
2. Small Spada Palace — Details	3/8" & 3"	
3. Balcony in St. James	1 1/2"	
4. Portico of Octavia — Façade	3/8"	26" x 36"
5. Doorway S M del Popolo—Detail	1 "	14" x 28"
6. Grille S. Pietro in Vincoli—Detail	1 "	14" x 28"
Color Studies in Vatican and Lateran		
Measurements, sketches, photographs.		

In general, I found conditions for study excellent during my first year abroad. The war had not begun to be felt very much, prices were normal, train service good, and the absence of tourists rather delightful. During this year there were about twenty-five men at the American Academy. Police regulations were strict, but as we were provided with the proper credentials, this was only annoying, but not very detrimental to work. Several students and one professor were arrested for slight matters, but suffered only short inconvenience—two were looking about with guide books, and Professor Frank was wandering near the

hangars of the aviation field. I was rather discouraged about sketching in the open by these arrests, but I used guide books and camera without trouble.

I did not visit Venice or the northern cities so do not know from personal observation what damage the war has done to the monuments of Italy. I do not, however, believe this was excessive. When I first arrived in Italy everything appeared normal as regards museums, etc., but within a year many were closed. In Rome the Borghese gallery, the Capitoline, Conservatori and Termæ museums and the castle of St. Angelo were closed, but the Vatican remained open. In Florence the museums were closed including the Uffizi gallery, but the principal works of art of the latter were transferred to the Pitti which remained open, being considered bomb-proof, so that the masterpieces of these two great galleries were on view side by side. Statues and monuments in Florence and all cities north of these were removed to places of safety or protected with sand bags. In the courtyard of the Palace of Venice, Rome, I saw (after the armistice) the four horses of St. Mark, the Colleoni statue and Donatello's famous equestrian statue of Guatamelata, which made a remarkable exhibition.

Very little building was done in Rome during the war, except one or two government buildings in various parts of the city. A large building for the Banco di Sconto opposite the Column of Marcus Aurelius, progressed, some of it being now in the fifth or sixth year of this progress. The Victor Emanuel monument is also nearing completion, it having been commenced about twenty years ago, I believe.

I saw the American building, designed for the Rome Exposition of 1911 by Carrere & Hastings, before it was torn down. The British building, by Lutyens, near the Villa Papa Giulio, is now used as the British Academy, it having been greatly enlarged.

America's entry into the war materially changed conditions for study. The students gradually left the Academy and no new ones came. When I entered the Red Cross in March, 1918, there were only four left (one a woman), and all later went into some branch of the service. After the first year, prices which had been normal began to rise rapidly, and in the summer of 1918 I found, when travelling, that where I had paid seven to nine lire per day at hotels just a year previous, I was obliged to pay fifteen to twenty-five lire. The price of a suit of clothes jumped from one hundred and sixty lire to four hundred, and everything in proportion. Food was poor, and sugar, oil, flour and sweets were not in the market at all much of the time. Much of this took place after I entered the Red Cross, but it had begun to make study difficult. The Italian defeat at Caporetto in October, 1917, and the subsequent anxious weeks made it almost impossible.

In regard to the money allowance of the Scholarship, I must say that at present it is quite inadequate to the needs of a travelling scholar and will be for some years. Before the war, living at the American Academy cost five lire—now it costs twelve lire. In 1917 I made the trip through Umbria and Tuscany mentioned above for thirty-five days, and spent six hundred and fifty lire, which included all travel, hotel and incidental expenditures. That was about 20 lire per day, but one year later my hotel expenses were almost always more than that, and travel would have cost forty lire per day if I had not had a railroad pass. I could multiply these examples indefinitely, i. e., Alinari photos which used to cost one-half a lire now cost just three times as much. The American Academy has, I understand, raised the allowance to $1250 per year.

I believe that I gained a great deal from my Scholarship. So long a residence among the monuments of Rome could not help leaving a lasting impression even during the war. I was able to get a new viewpoint of architecture, to remould many ideas which were faulty, and to polish up many ideas that had been dormant. Several years' office work had taught me what to look for, and I went after it as hard as I could. Impressions of scale, which photos do not always give, were constantly being received and have been a valuable part of my training abroad.

Many students find much fault with the making of envois. I believe that it is the best thing to do, however, and feel that the amount of work required by the Rotch Travelling Scholarship is about right in proportion to the time. I have sometimes thought that in place of one envoi, an original composition might be substituted to be made from a program given by the committee and worked out in a style based upon a certain monument or villa or what-not chosen by the student, photographs of which could be submitted with the rendu. This is only a suggestion, however, and may be taken for what it is worth.

A word in regard to my work with the American Red Cross may be of interest. I was stationed in Rome and worked in the provinces of Lazio (Rome), Umbria and the Abruzzi. I travelled a great deal, sometimes by auto, and so came to be very familiar with these interesting parts of Italy. My special work was administering the

(*Continued on page* 143)

Editorial Comment

Safeguarding the Declaration and the Constitution

THE *Insurance Monitor* in a recent issue directs attention to the peril of destruction by fire that menaces original copies of the Declaration of Independence and the Constitution of the United States, and appeals to the National Board of Fire Underwriters and the Daughters of the American Revolution (why not the Sons, too?) to renew the efforts to secure the removal of these priceless historic documents to a place of safety.

At present they are lodged in an ordinary steel safe, surrounded by all sorts of combustible material, in the building of the State, War and Navy Departments at Washington.

The *Insurance Monitor* states:

> According to that underwriters' report no less than five carpenter shops are located in its (State, War and Navy Building) basement, surrounded by scores of rooms filled with highly inflammable contents, and the whole linked by open passages from cellar to garret to act as feeders for flames. Those who recall the destruction of the Equitable Building, believed to be fireproof, need not be told what must happen should a favorable fire once gain headway in this great national storage house.

While the Senate is busily occupied in making safe for future generations the heritage contained in the Declaration and the Constitution, it might well take opportunity to secure against destruction the documents that are the physical records of principles that they are endeavoring to safeguard. It is time we had a building that would safely house the Government's archives. While many of these documents lack the deep significance that hedges about the Declaration and the Constitution, they are none the less of the utmost value and their destruction would be not only an irreparable loss but a constant reproach to us as a people and a lasting evidence of our carelessness.

War Memorials

THE Chief of the Arts and Prints Division of the New York Public Library, Mr. F. Weitenkampf, undoubtedly voices the sentiments of librarians all over the country, who have regretted their inability adequately to supply the present great demand for books and exhibitions of war memorials.

Mr. Weitenkampf, writing in the Library Bulletin, states:

> When little has been published on a subject of coming importance the librarian cannot offer much to guide public intentions. That was in a measure the condition about two years ago, when there were some calls for information on war memorials. There was not much to offer in answer, except Lawrence Weaver's book "Memorials and Monuments." That was issued in London as early as 1915 with the expressed hope that it "may be useful to people who are considering memorials and that it may lead them to the artist rather than to the trader." That such a move was necessary was shown by designs appearing in certain architectural periodicals within the following year. This Library's collection of pictures of soldiers' and sailors' monuments was not of great help, since much of it illustrated what to avoid, but without written comment to point out that fact.
>
> In the past year or so there have been published articles, lectures, resolutions, and interviews, in increasing number, urging discretion in memorial-making. Various suggestions have been made: community houses, flag-pole bases, shrines, library buildings, arches, fountains, trees, bridges, and various other forms have been dilated on in the endeavor to "warn against stock patterns of metal founders" and to "save nation from war horrors," as two newspaper headlines put it. This material the Art Division of the Library has indexed and collected. The result is not overwhelming as yet—a dozen or so titles in the catalogue, and a folder of mounted cuttings—but it is a beginning. And it is a guide post.

We know that "of making many books there is no end," and in this vast outpouring it was natural to suppose that every important topic had been in some degree discussed and fully set forth.

Yet here we have a topic that at this time is one of world-wide importance and with it the statement of a good authority that there are no reliable works on the subject. Just here is an opportunity for architects to become authors. What group of men could with greater skill or more authority discuss the subject of war memorials?

Architects Aid Low Cost Housing

THE matter of the architectural planning of low cost houses, now being widely discussed by readers of THE AMERICAN ARCHITECT, is reflected by the action of St. Paul members of the profession. Architects of that city are now organizing a service bureau to aid prospective home owners. Service including both planning of dwellings and estimating cost will be furnished without charge to citizens who decide to own homes.

The bureau will have numerous plans, especially for moderate priced houses, such as those from $3,000 to $5,000. In addition architects in the city will contribute two sets of plans and specifications with an accurate estimate of construction costs each month. Although the work is only being organized, many applications are being received daily, the majority of which are from wage earners.

This is one indication that shows the eagerness

of the layman to rise to the dignities of an architecturally good house. If this were done on a larger scale the response would doubtless be correspondingly increased, with all the good results in the architecture of the low cost house that might be expected to follow.

The Ugly City

IN the July issue of the *Atlantic Monthly,* Henry Justin Smith, news editor of the Chicago *Daily News,* sets down, under the title of "The Ugly City," a series of somewhat depressing impressions as to the visual aspect of Chicago.

Mr. Smith presents an argument that can be subjected to the "fifty-fifty" process of analysis. Fifty per cent of his indictment will undoubtedly be approved by architects; the remaining half can be debated as to its accuracy of statement.

His pessimistic description of Chicago as one enters it by any of the many railroad lines is correct, but the characteristics he so strongly accents as to Chicago are equally apparent in all of our large cities. Chicago is no more unsightly in its loop districts than are either New York's or Boston's similarly located sections. There are "ghettos" and "quarters" in all large cities, that are equally deplorable as those Mr. Smith so strongly censures in Chicago.

The cause of Chicago's ugliness is summed up by Mr. Smith as neglect, the result of an "upbringing by the hands very largely of hurried, greedy, unfastidious folk, who will continue for years to ignore the fact that its face is caked with dirt, its clothes filthy and torn."

The fault with Chicago is the common fault of many of our large cities—political misrule. The record in Chicago is one of strenuous effort on the part of many societies to remedy the things Mr. Smith so strenuously points out. The hurried rebuilding after the fire, the enormous and rapid increase of population, has caused the present unsatisfactory conditions.

The activities of citizens and societies we fear are not taken by Mr. Smith at their full value. For example, he says:

"To the sagacious plans of the Illinois Chapter of the American Institute of Architects, headed by George W. Maher, I should like to give more than a paragraph. But if I gave them numberless paragraphs, I should still insist that to the factory worker, the shop-keeper in a small way, unquestionably to poor creatures lower in the scale, the Chicago plan, indeed all the pretty pictures and costly diagrams of a better city must be like a mirage."

Very true, but the efforts of the Illinois Chapter and the City Plan Commission and of architects generally, are not drected to secure the co-operation of the groups of people that Mr. Smith mentions, but to that smaller group, that influential and often politically controlled few who as property owners are responsible for "the ugly city." What Chicago needs, and what every other city needs, is first of all the subjugation of pernicious political elements, the adoption of a well devised zoning law, and a listening ear to the counsels of its architects.

Lamentations as to conditions that surround an ugly city may serve as material for a magazine article, but it is unfortunate that one that will undoubtedly have such wide circulation should not receive the critical analysis it deserves on the part of the architectural profession, particularly in this instance of those in Chicago and its suburban towns.

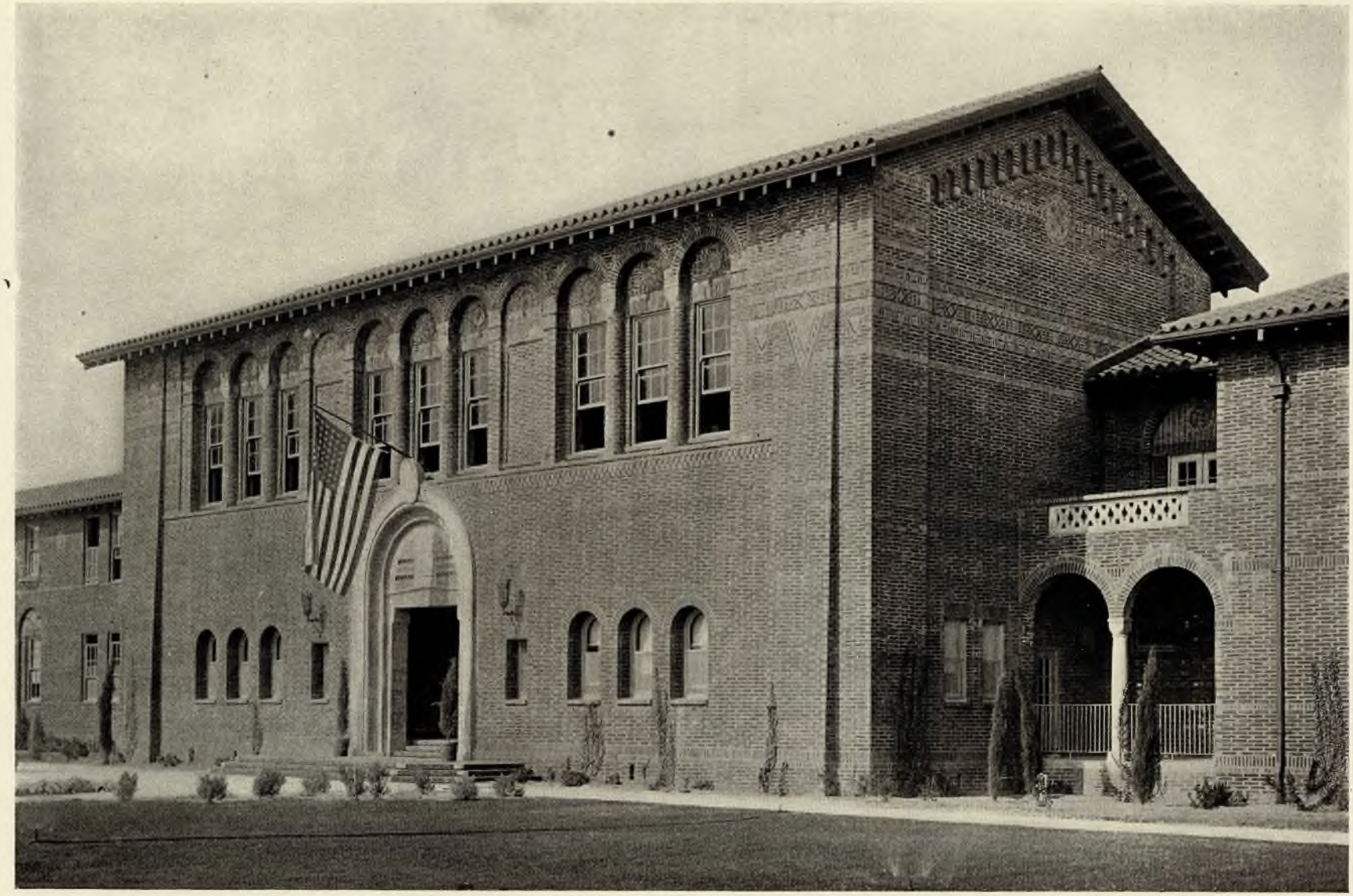


PLATE 37

CENTRAL PAVILION OF MAIN FACADE

STATE NORMAL SCHOOL, FRESNO, CAL.

CALIFORNIA STATE BUREAU OF ARCHITECTURE: GEORGE B. McDOUGALL, *STATE ARCHITECT*

DETAIL OF ENTRANCE, STATE PRISON, FOLSOM, CAL.

MAIN CELL BUILDING, STATE PRISON, FOLSOM, CAL.

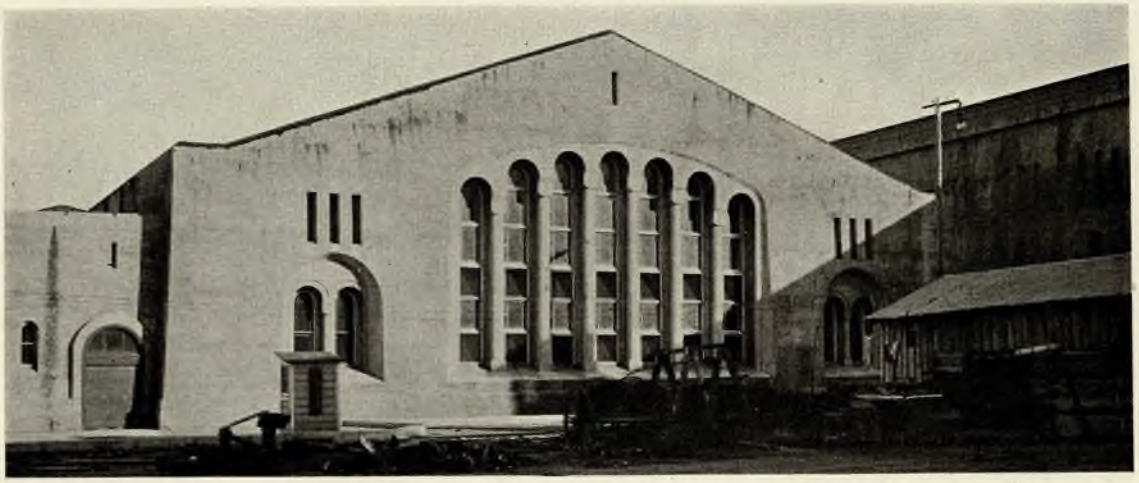
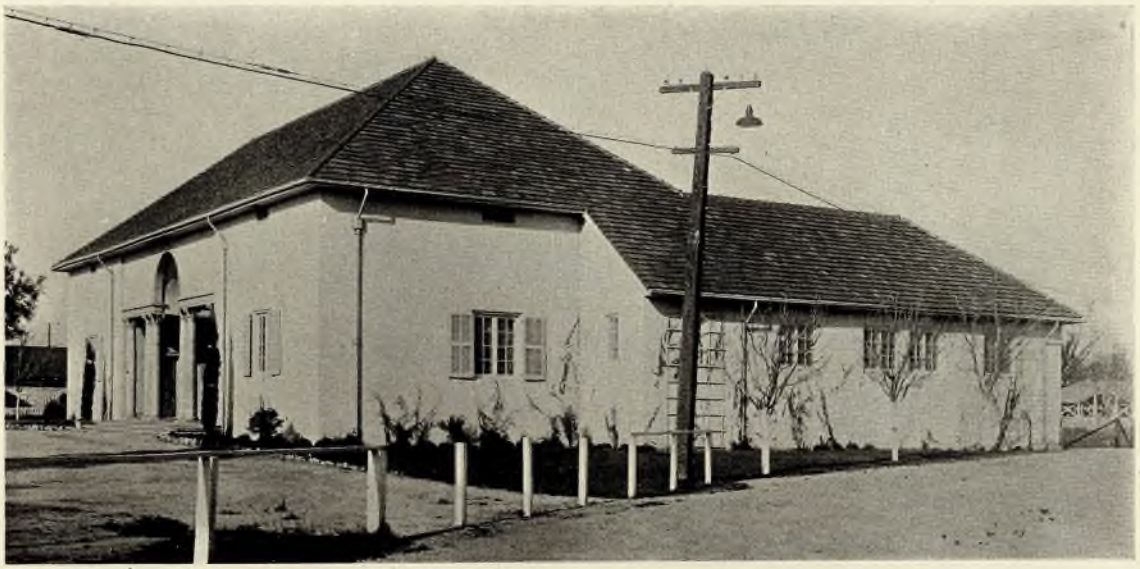


PLATE 38 DINING HALL, STATE PRISON, SAN QUENTIN, CAL.

CALIFORNIA STATE BUREAU OF ARCHITECTURE: GEORGE B. McDOUGALL, *STATE ARCHITECT*



GENERAL VIEW

PLATE 39 DETAIL OF MAIN ENTRANCE

WOMEN'S BUILDING, STATE FAIR GROUNDS, SACRAMENTO, CAL.

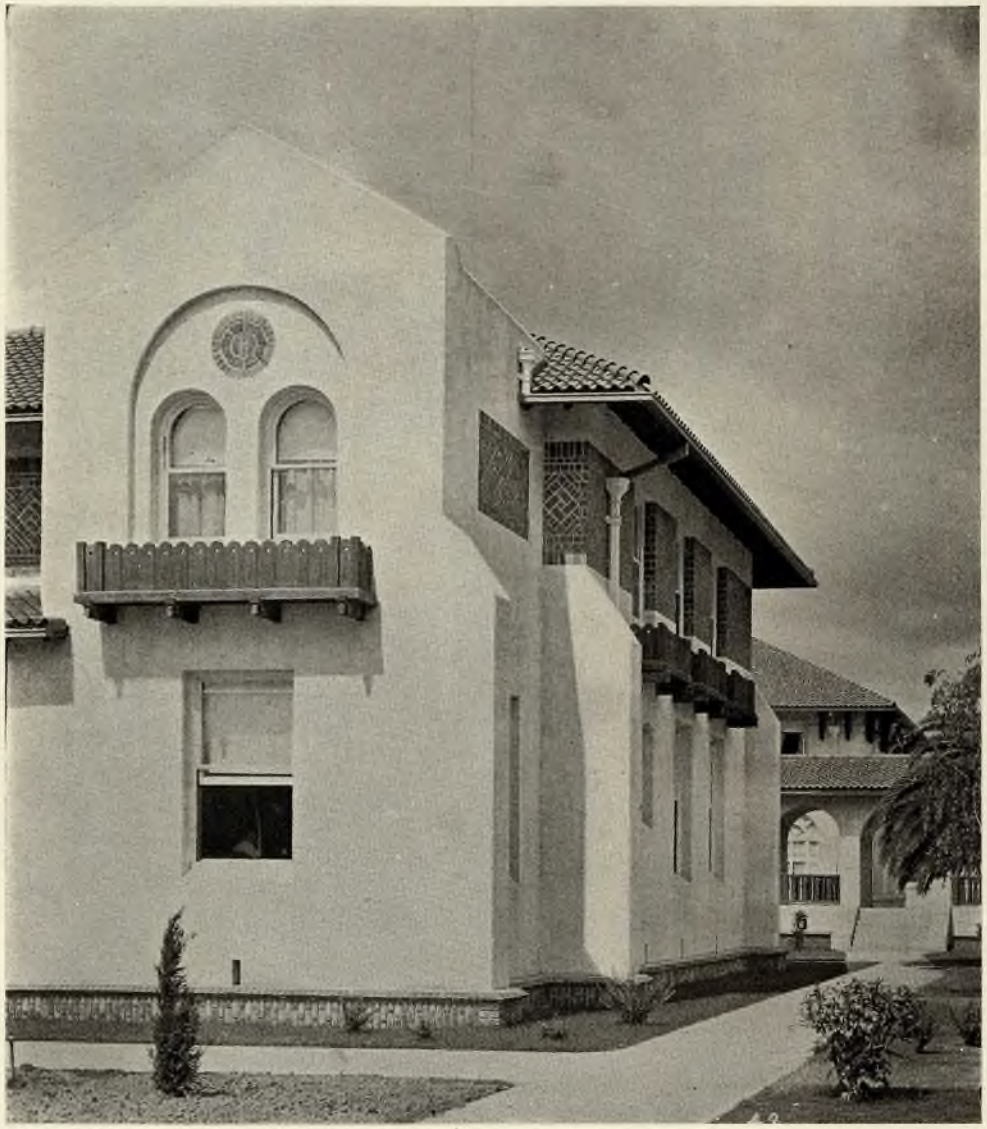
CALIFORNIA STATE BUREAU OF ARCHITECTURE: GEORGE B. McDOUGALL, *STATE ARCHITECT*

WATER TOWER, STATE SCHOOL, WHITTIER, CAL.

PLATE 40

SUPERINTENDENT'S HOUSE, STATE SCHOOL, WHITTIER, CAL.

CALIFORNIA STATE BUREAU OF ARCHITECTURE: GEORGE B. McDOUGALL, *STATE ARCHITECT*



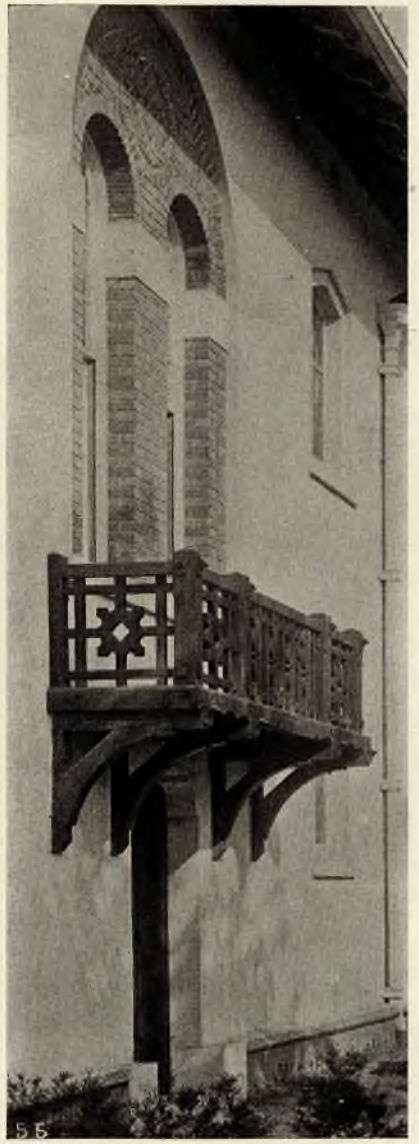


PLATE 41

TREATMENT BUILDING, STATE HOSPITAL, AGNEW, CAL.

CALIFORNIA STATE BUREAU OF ARCHITECTURE: GEORGE B. McDOUGALL, *STATE ARCHITECT*

TREATMENT BUILDING, STATE HOSPITAL, AGNEW, CAL.

PLATE 42

ADMINISTRATION BUILDING, STATE HOSPITAL, AGNEW, CAL.

CALIFORNIA STATE BUREAU OF ARCHITECTURE: GEORGE B. McDOUGALL, *STATE ARCHITECT*

CAFETERIA BUILDING, STATE NORMAL SCHOOL, SANTA BARBARA, CAL.

PLATE 43

COURT OF MAIN BUILDING, STATE NORMAL SCHOOL, SANTA BARBARA, CAL.

CALIFORNIA STATE BUREAU OF ARCHITECTURE: GEORGE B. McDOUGALL, *STATE ARCHITECT*

EXTERIOR OF CLOISTER

PLATE 44 INTERIOR OF CLOISTER

STATE NORMAL SCHOOL, SANTA BARBARA, CAL

CALIFORNIA STATE BUREAU OF ARCHITECTURE: GEORGE B. McDOUGALL, *STATE ARCHITECT*

MT. WHITNEY FISH HATCHERY, INYO CO., CAL.

PLATE 45

MODEL ONE-ROOM SCHOOL BUILDING AT CHICO STATE NORMAL SCHOOL

CALIFORNIA STATE BUREAU OF ARCHITECTURE: GEORGE B. McDOUGALL, *STATE ARCHITECT*

Student Life in Italy

(*Continued from page 140*)

workrooms for the district. I had under my charge seven workrooms and four shoe factories, besides twenty small places where work was given out to be done at home. About 1500 to 2000 women were employed sewing, knitting and making shoes. The monthly payroll was about $15,000, and cost of material $20,000. About 20,000 articles were produced and distributed monthly to the needy—principally children—in our district. I had a secretary and twelve assistants to aid me in this work. It was something quite different from anything that I had expected to do, but I believe that I gained a lot from this very interesting experience.

RALPH J. BATCHELDER.

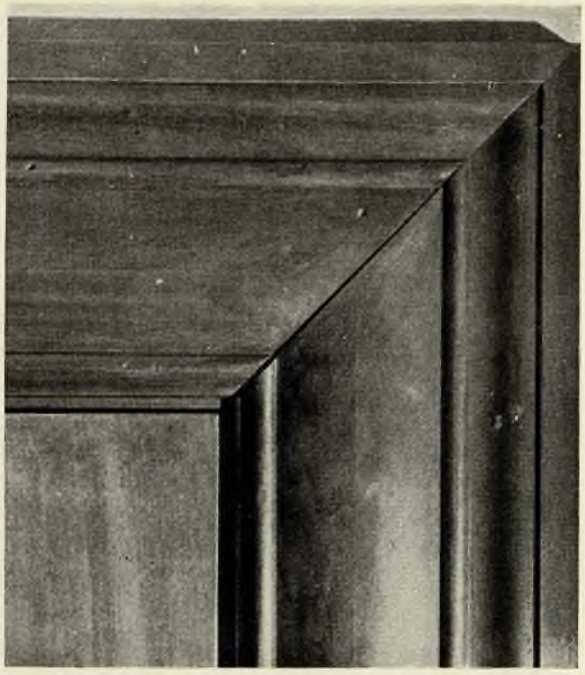
Shrinkage of Interior Trim: Its Cause and Prevention

By LAWRENCE V. TEESDALE*

IT is very disheartening to the architect on visiting a building a few months after it is completed to find the interior trim shrinking, the glued and mitred joints pulling apart, the door panels showing unfinished areas, or the cracks in the floors opening up. These troubles are caused by moisture changes in the wood after it is in place. Insufficient kiln-drying or the absorption of moisture following the removal of the wood from the kiln make redrying and shrinking possible after the trim is in place in the building. If the cause and effect of moisture changes in wood were well understood and appreciated, such troubles as these might be avoided, or at least minimized, by the proper drying and handling of the stock.

Contrary to the general impression, wood never becomes absolutely dry, but will retain some moisture even in a very dry atmosphere. Thoroughly seasoned lumber, dried in the open air, retains from 12 to 15 per cent moisture,[1] whereas furniture and interior woodwork vary from 4 to 6 per cent moisture content in the winter when rooms are heated, and from 6 to 8 per cent during the spring and summer months. Inasmuch as air-dried lumber continues to dry when placed in buildings, all stock for interior finish must be kiln-dried to about 5 per cent moisture content before it is fit to use. This is done to prevent the shrinkage that would occur in wood when drying from 12 down to 5 per cent, or from the air-dry to the room-dry condition. It is just as necessary to prevent the kiln-dried wood from absorbing moisture, which will dry out later and cause shrinkage as it is to kiln-dry it in the first place. A loss of only 2 to 3 per cent is sufficient to cause perceptible shrinkage in hardwood lumber of low moisture content.

The first step, therefore, in preventing shrinkage troubles is to obtain material that has been kiln-dried to the proper moisture content. This will vary from about 10 per cent at the seashore or in damp climates to about 5 per cent in drier climates



GLUED AND MITRED JOINTS PULLING APART

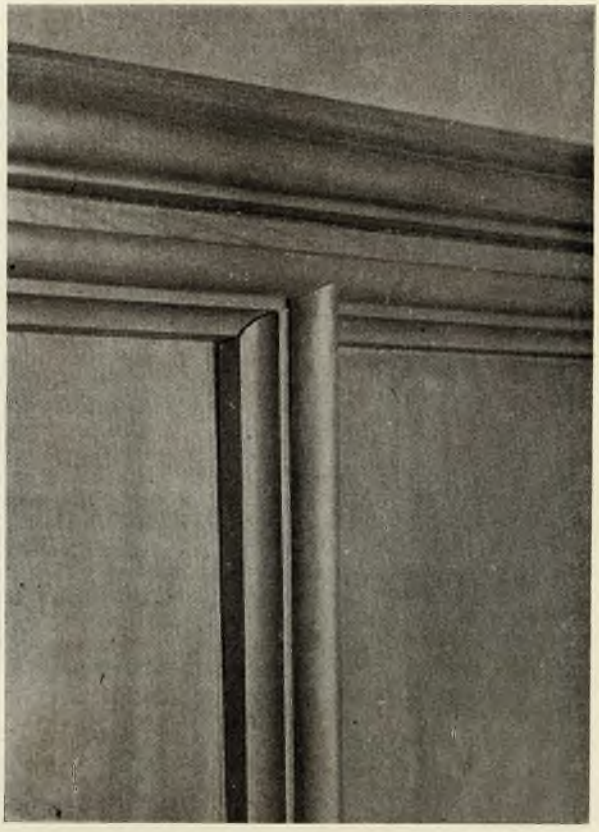
Typical example of the shrinkage which occurs when insufficiently kiln-dried material is used

*Architectural Assistant in Forest Products, Forest Products Laboratory, U. S. Forest Service, Madison, Wisconsin.

[1]Moisture content is calculated from the oven dry weight of wood.

or where buildings are kept heated for several months during the year.

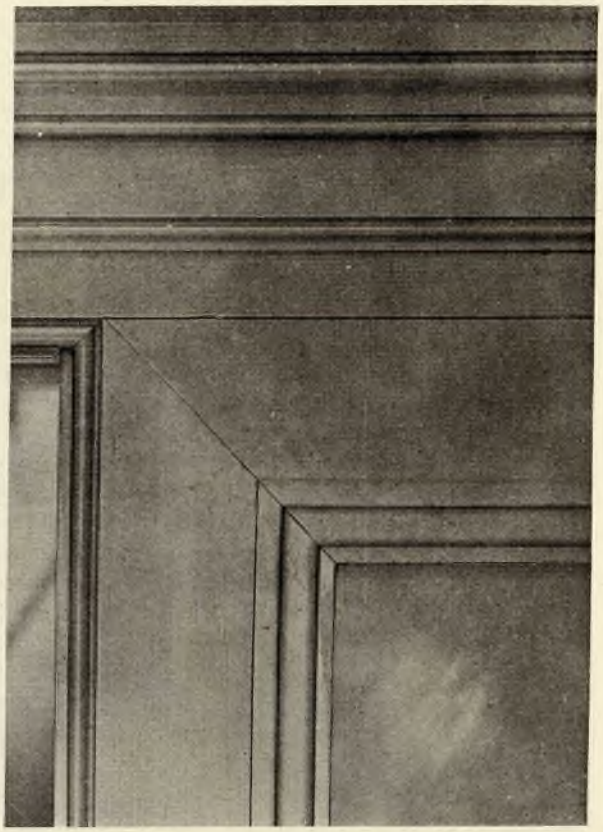
To specify the moisture content to which the wood is to be dried will not be sufficient unless the architect selects a mill equipped with kilns capable of meeting specifications. In the days before the war it was possible for the mills to obtain thoroughly air-seasoned material that could be left in a hot box kiln until it was judged to be thoroughly dry. Now as there is comparatively little air-dry material in the market, the mills must use stock that ranges all the way from air-dry to green and their drying problems have become very important. Investigations made at the U. S. Forest Products Laboratory show that stock properly kiln-dried from green material will meet the most exacting requirements and is superior for almost any purpose to material kiln-dried from air-dry stock. However, green stock cannot be kiln-dried under the same conditions as air-dry stock, nor can it be dried in the same time. This makes it necessary to use kilns that are designed to handle green material and which are under the supervision of a competent operator. If the wood has not been sufficiently dried for the purpose for which it is to be used, nothing can be done to keep it from shrinking and causing trouble.



EFFECT OF UNEQUAL SHRINKAGE OF BUILT-UP RED GUM MOULDINGS

The imperfectly seasoned cove moulding pulled away from the thoroughly dried half-round moulding, which did not shrink

The second step is to prevent the stock from reabsorbing moisture from the time it leaves the dry kiln until the painter has completed his work. Flooring and lumber that are to be used for fine interior work should not be stored outdoors or in



EFFECT OF UNEQUAL SHRINKAGE ON BUILT-UP MOULDINGS

open sheds after kiln-drying, because they will absorb moisture from the atmosphere. Such stock should be stored in dry rooms at the mill. It should not be delivered at a new building during damp weather nor until the building is thoroughly dry. Unfinished wood will pick up moisture very rapidly from green brick, concrete, or plaster walls. It is usually customary in buildings that are being completed in late fall and winter temporarily to connect the radiators and keep the rooms warmed where the painters are at work. If this is done while the plasterers are working, it will assist in drying the plaster and provide dry storage for the trim when it is delivered.

The wood should receive the filler or priming coats at the mill if practicable; otherwise, imme-

TYPICAL EXAMPLE OF TANGENTIAL AND LONGITUDINAL SHRINKAGE IN MOULDINGS CUT TO A RADIUS

diately after being delivered at the building. A stain, such as is used on close-grained woods, is not a filler nor will it resist absorption of moisture. In fact, water stains will add moisture to the wood and should only be used where oil or spirit stains will not produce the desired effects. When it is necessary to use water stains, the wood should be allowed to dry at least 48 hours before applying a coat of shellac or varnish. Finally, if an egg-shell finish is desired, heavy-bodied or gloss varnishes that can be rubbed should be used in preference to the usual flat or self rubbing varnishes, which have but little protective value.

High-grade panel work and wainscoting against outside walls should always be back-painted; otherwise, the dampness absorbed from the walls through the unprotected back is very likely to cause buckling of the panels and later opening up of glued joints.

The swelling and shrinking of doors usually requires the attention of a carpenter from time to time for weeks after the building is occupied. The fact that the top and bottom edges of a door are practically always left unfinished is largely responsible for this trouble. The exposed ends of the vertical stiles are particularly troublesome, since wood picks up or gives off moisture more rapidly through surfaces cut across the grain than through those parallel to the grain. It is imperative that the top and bottom edges of all doors be protected by paint or varnish and if it is necessary to refit the door after it is hung, the freshly exposed surface should be refinished at once.

GREENHOUSE ON GROUNDS OF JAMES BROWN, NEWTON CENTER, MASS
COOLIDGE & CARLSON, *ARCHITECTS*

Current News

Outline Plans and Purposes of New York State Association

The first issue of the monthly Bulletin of the New York State Association of Architects has been received, and from its interesting pages it is good to learn that this valuable organization is off to a fair start.

The purposes of this association are very clearly set forth in an article contributed by Mr. Frederick L. Ackerman, while Mr. Robert D. Kohn writes interestingly of the organization meeting recently held in Utica.

As an incentive to other states to follow a movement so well conceived and auspiciously inaugurated, we present extracts from Mr. Ackerman's article, and reprint the Constitution and By-Laws.

Mr. Ackerman writes:

What possible value can result from creating a new organization of architects in the State of New York?

To answer that question fully would require a careful evaluation of the activities and purposes of existing organizations. That I should not attempt since, through the nature of the qualifications for membership, this new association reaches out into a field not now enclosed by any of the existing associations.

Basing the qualifications for membership, as it does, upon registration and inviting into membership as junior members practically all of those who have chosen architecture as a vocation, it emerges at the very outset as a truly vocational organization. This condition alone differentiates it from all other related organizations within the state and provides a medium through which the opinions of the entire vocational group may become crystallized and find expression.

Such an organization would possess all of the characteristics of democracy; its policies and its acts would be truly expressive of the actual state of affairs within the entire vocational group. What such an organization hoped to accomplish, what it actually accomplished, would furnish the criterion by which the actual purpose of the profession could be judged.

Hence, one may assume that the central purpose of this new organization, which purpose is implied in the qualifications for membership, is that of integrating the opinion, the aims and the purposes of the entire vocational group within the state.

That there is a common purpose or aim among the widely diversified groups of practicing architects, or among architects and their assistants, is not now evident; that there should be a common purpose is clear; to establish such a common purpose and to make it real in practice is the function of this organization.

But to be more specific as to what it might accomplish: In a not distant future only registered architects will be allowed to practice architecture in the state. Whatever value there may accrue from this regulation, depends absolutely upon whether or not the profession as a whole sees to it that the act of registration shall express the fact that a person so registered is really competent to engage in this vocation.

It therefore becomes the first duty of the entire vocational group within the state to provide such facilities, either within or co-ordinated with their offices, that it will be possible for their assistants to acquire a knowledge of that phase of architectural practice, the possession of which is so vital to the profession but which these assistants cannot now acquire under the present system of office management or under the auspices of our academic institutions.

This work, which cannot be accomplished except through the co-ordinated effort of all practicing architects and of all of their assistants, the urgent need for immediate action in this field, furnishes in itself a justification for the creation of this organization.

Conditioning and controlling the practice of architecture in urban districts (and soon to condition and control the practice of architecture throughout the state) are laws and ordinances relating to building which have been formulated largely by groups and individuals in other callings. Many of these laws and ordinances are of such a nature as to thwart the development of rational building. To see to it that these are modified, to see to it that new laws are framed to cover a field of building in urgent need of proper regulation falls as a duty not upon a few of the profession but upon the entire vocational group. An organization such as this we are now forming will have not only this duty to advise but will eventually have the right to speak with authority to our State Government on all matters of building legislation and public policy with regard to building matters.

So much merely by way of pointing out but two of the purposes which actuated the creation of this Association. There are other aims less tangible, less easily expressed, which also actuated this movement. These aims relate to certain tendencies which appear to be emerging in the modern world. We are just beginning to discover that the old concept of democracy, functioning through political representatives of political groups, is a concept of the past. A new concept of democracy is developing; a new order is being established gradually in our vocational representation of one sort or another and is asserting itself as a substitute for the old scheme of purely political representation.

But to what extent this will be carried out in action no one can state at present. It must be evident to anyone that under the complex conditions surrounding modern life, the social purposes of a vocational group cannot find free and full expression except by positive assertive action on the part of the entire membership organized around a common purpose.

The purpose, therefore, of this organization is that of bringing together into one body all members of the vocation in the state, to the end that there shall develop a better understanding of what constitutes the function of the architect in society and also to the end that whatever opinion such a group may hold concerning policies related to building in general may be more clearly formulated and more clearly stated by all of the members constituting that vocational group.

The Constitution and By-Laws as adopted at the organization meeting are as follows:

CONSTITUTION

NAME

The name of this Association shall be the NEW YORK STATE ASSOCIATION OF ARCHITECTS.

PURPOSE

This Association seeks to unite in fellowship those engaged both as principals and assistants in the practice of architecture in the State of New York, so that they may combine their efforts for the promotion of the efficiency of the profession, and to make the practice of Architecture of increasing service to society.

BY-LAWS

ARTICLE I—HEADQUARTERS

The headquarters of the Association shall be located within the State of New York, where designated by the Board of Directors, and may be changed from time to time at the discretion of the Board.

ARTICLE II—MEMBERSHIP

All architects registered in the State of New York, and all architects whose standing in practice is approved by the Board of Directors, are eligible to membership in this Association. All draftsmen over 21 years of age employed in the office of an architect eligible to membership in the Association may become Junior Members of the Association. Junior members shall have no vote at meetings of the Association, but shall have the privilege of the floor and all other privileges of membership.

ARTICLE III—OFFICERS

The officers of the Association shall be a President, three Vice-Presidents, a Secretary, and a Treasurer, who shall hold office for the current year or until their successors are chosen.

Also a Board of Directors, which shall consist of the President, the three Vice-Presidents, Secretary, Treasurer, and five others, all of whom shall be elected at the annual meeting of the Association.

The Board of Directors shall perform the usual duties of their office, and shall transact all business between meetings of the Association.

The President, three Vice-Presidents, Secretary and Treasurer shall perform the usual duties of their respective offices.

The officers shall report fully to the members all matters relating to the Association and to the welfare of its members.

ARTICLE IV—COMMITTEES

The Board of Directors shall appoint all committees, but no committee shall consist of less than three members. The Standing Committees shall be as follows: Membership, Public Information, Legislation, Public Improvements, and Education.

The President and Secretary shall be ex-officio members of all committees, but shall have no vote in committee except to establish a quorum.

Special committees may be appointed by the members or by action of the Board of Directors at any meeting.

All committees shall report to the Board of Directors, and a synopsis of all reports shall be distributed to the members through the Board.

ARTICLE V—MEETINGS

The Association shall hold its annual meeting in Albany or elsewhere in February of each year, for the election of officers and the transaction of such other business as may come before the meeting.

Special meetings shall be called by the Secretary or President, when requested by the Board of Directors, or upon the request of thirty members in good standing.

A quorum at any meeting of the Association shall consist of not less than fifteen members.

ARTICLE VI—ELECTIONS

A majority of the votes cast by the members present at the annual meeting shall constitute an election.

The newly elected officers shall take office at the adjournment of the meeting at which they were elected.

ARTICLE VII—DUES

The fiscal year shall coincide with the calendar year.

The annual dues for members shall be five dollars, payable on or before February first of each year.

The annual dues for junior members shall be three dollars, payable as provided for members.

The Directors may drop from membership all in arrears for dues for a period of more than three months, provided that due notice is mailed to the members in arrears of such intention.

All registered architects whose registration is canceled by the State for any cause, or any member dropped from the roll, shall automatically cease to be members of the Association, and thereafter shall have no claim, title or interest in the property of the Association.

When any member ceases to practice architecture as a primary occupation, he may be dropped from membership by a two-thirds vote of the whole Board.

All resignations shall be presented in writing to the Secretary, who shall submit same to the Board, and such resignation shall be subject to the action of the Board.

ARTICLE VIII—AMENDMENTS

These By-Laws may be amended by a vote of two-thirds of the members present at any meeting, provided that thirty days' notice is given through the Secretary to the members of intention to amend.

The representative character of the men who have given time and serious thought to the formation of a State organization, which has such large possibilities of good to the profession in New York State and by example to every other State, should insure the support of every architect in New York.

Inter-Allied Housing Conference Proposed

All the countries which have been engaged in the war have their housing problems. Our own is serious enough, but it is simple in comparison with those countries whose towns and villages have been destroyed by the enemy. As far as the Allies are concerned, an attempt is to be made to work in co-operation. An Inter-Allied Congress on housing and town-planning has been arranged to be held in London on November 4, 5, and 6. The questions of legislation and finance affecting housing will be discussed, and no doubt there will be a profitable interchange of views; but whether the Conference will succeed in impressing its views on the various Governments remains to be seen. The Congress-Bureau is at 41, Russell-square, W. C.

Advisory Committee on Memorial Buildings

The national committee on memorial buildings, composed of 100 representative citizens from all parts of the country, announces its amalgamation with the War Camp Community Service, in its important task of advising as to the erection of memorial buildings in honor of soldiers and sailors.

The committee, which was formed for the purpose of advocating the erection of suitable and useful memorial buildings, retains its original personnel, and continues the full scope of its activities, but will hereafter be known as the advisory committee on memorial buildings.

It will function under the close guidance of the War Camp Community Service, and has at its disposal that organization's large staff and many bureaus.

The committee was formed to advise states and municipalities as to suitable and appropriate memorials, to guard against the danger of hastily planned monuments, to avoid risk of wasting large sums on ill-conceived memorials, and to turn into useful channels the enthusiasm for honoring our fighting men.

Franklin K. Lane, Secretary of the Interior and honorary chairman of the committee, has sent letters to 5,000 cities and towns suggesting "living memorials" as the most appropriate and lasting form of memorial, which would be in keeping with the spirit of the day.

The advisory committee has issued bulletins on "Community Houses as Soldiers' and Sailors' Memorials," "Provision for Art, Music and Drama in Liberty Buildings," "Memorial Building Movement Reports From Cities," "A Living Memorial," "The Memorial Community House: What It Should Be and Who Should Manage it."

To Exhibit Allied Building Materials

The Louvain Association of Architects is organizing, during August and September next, an exhibition of building materials manufactured in Allied countries. Exhibits are invited, and full particulars can be obtained from the Secretary, Association des Architectes de Louvain, 48 rue de Tirlemont, Louvain, Belgium.

Cites Advantages of the Fence

Fences were very unpopular in America for a number of years, writes a Scranton paper. The idea of small town and suburban dwellers was to throw open their yards to the public, providing their best display for the passerby. There was something generous about it—an open-hearted, genial, social quality which characterizes Americans in many relations in life.

Within the last few years Americans have begun to discover that the land about their house should be treated as a part of the home and that it should have the charm of intimacy and privacy. They have reversed to the ways of the early Colonial days, when the fence was not only a protection but an ornamental part of the grounds. Some of the fences around the old houses in the South bear witness to the state and dignity of the persons who lived behind them and through the gates one still gets glimpses of charm that would lose by half if they were not secluded and kept for the people who live in the houses of which they form the setting.

We are still borrowing the foreign idea, hesitatingly, of turning our houses about, with their backs to the street and their fronts to a garden or lawn and flowers which may be as fully and freely enjoyed as the most comfortable living room in the house.

But to go back to fences. A quaint seaside house that was built on Long Island a few years ago had rather a desolate and detached air, set upon the sands which had been reluctantly induced to produce a meagre lawn and a few shrubs. Last year the property was surrounded with a low post and rail fence painted the same color as the house, and at each post a rambler rose was planted. In a few years that fence may be covered with roses.

One of the advantages of having a fence is that one may then also have a gate, and a gate is a good feature for architectural treatment.

Inside a fence one may have a formal hedge, or an informal planting of shrubbery—a pleasing combination. The fence may be made as individual as the house. It may be high, low, plain or ornamental to accord with the house, and lends itself to many variations and possibilities in design.

Explains Chicago's City Plan

A book entitled, "What of the City?" has been written by Walter D. Moody for city planners at large, but with specific reference throughout to the needs of Chicago. This city may be regarded as typical of what will happen when allowed to sow its wild oats in its youth, and what can afterward be done toward its redemption.

The reader, even though familiar with Chicago, will lay down the book amazed at what has already been done to make the city fit. But one also realizes what remains to be done, the enormous sums yet to be spent and the educational work required to bring the people to vote these sums.

Before his death, Daniel Hudson Burnham, chief author of the plan, left this inspiring charge behind:

"Make no little plans; they have no magic to stir men's blood, and probably themselves will not be realized. Make big plans, aim high in hope and work, remembering that a noble, logical diagram once recorded will never die, but long after we are gone will be a living thing, asserting itself with growing intensity. Remember that our sons and grandsons are going to do things that would stagger us. Let your watchword be 'Order!' and your beacon 'Beauty!'"

Four herculean tasks the city has already performed—the raising of her street level, sixty years ago; lifting herself from the ashes of 1871; the drainage canal, and the Columbian exposition. But these Mr. Moody regards as only tests of her youthful strength, the hardening of her sinews for the carrying out of her manifest destiny. He sums it up thus:

"We in America to-day must solve our own problems and supply our needs with our own resources. Nearly 200 cities in America have dabbled to some extent in what is termed city planning, but in scarcely a dozen has any real progress been made.

"Success is impossible until it is realized that in this country no public improvement can be made without public approval. The people will not give their consent to spending money for projects which they do not understand. It requires long and arduous effort to span the chasm between the practical ideals of a city plan and the wretched order of physical development unfortunately so prevalent in American cities."

French Architects Visit This Country

Six French architects, engineers and contractors, forming an official commission, are visiting this country to study various American developments which would aid the French Government in their reconstruction plans. The party is composed of Jacques Greber, architect; Pierre Nugue and Victor Perreaud, engineers; René Bonhomme, building contractor; Charles Jacob, sanitary engineer, and Dr. Paul P. Cret, who before the war was professor of architecture at the University of Pennsylvania. The commission is studying particularly the various housing developments in this country and is visiting besides industrial centers for the purpose of studying mill construction and operation. It probably can be reached by addressing Dr. Cret at the University of Pennsylvania.

Show Why Now Is Time to Build

Four years ago, states a Burlington, N. J., paper, a farmer sold 150 hogs to build a home costing $2,900. Recently a neighbor sold the same number of hogs, built a replica of the house and put $5,388 in the bank. This probably is one of the most forcible illustrations of the fact that building materials have advanced less than any other commodities on the American market. Recent figures of the United States bureau of labor statistics show an advance of 57 per cent in building material, whereas food, clothing, house furnishings, etc., have scored far greater advances. It is time now to build the home. Delay will mean only a higher cost.

Issue Bibliography of Industrial Housing

The United States Department of Labor has issued a pamphlet from a Bibliography of Industrial Housing in the United States and Great Britain, during and after the war. This is a reprint from the report of the Bureau of Industrial Housing and Transportation of the United States Housing Corporation.

A prefatory note to this bibliography states that it represents published material to which members of the United States Housing Corporation staff had access in its reference library.

The bibliography contains principally such articles on the topic of Industrial Housing that have appeared and to which authors' names have been signed. Unfortunately there are not included any reference to a great number of magazine articles that during the past two years have appeared in the Architectural and Construction papers, to which no names have been signed.

While this bibliography will in a sense assist the student of industrial housing, its failure to include so large a number of references to important discussions of the topic has largely robbed it of much important material.

The pamphlet may be secured by request from the Department of Labor, Washington, D. C.

Personal

The architectural and engineering firm of Payne & Adams which, owing to the death of Mr. Adams and Mr. Payne's going to France as a major in the Coast Artillery Corps, was discontinued, has been reorganized under the name of Payne & Griswold, Architects and Civil Engineers, Plant Building, New London, Conn. They desire to receive catalogs from manufacturers and material men.

A. I. Mills, architect, has opened an office at 25 E. Mills Avenue, Detroit.

Clark & Dudnick, architects, have opened offices at 618 Drexel Building, Philadelphia.

John Barnard, architect, 20 Beacon Street, Boston, Mass., has moved to 8 Beacon Street.

H. H. Green, architect, Chicago, has moved from 155 N. Clark Street to 1510, 30 S. Michigan Boulevard.

Silas Jacobsen has removed offices from 601-2 Capital Bank Building, to 400-3-4-5 Endicott Building, St. Paul.

Dennis & Knowles, architects, Minneapolis, have moved from 1151 Plymouth Building to 633 Secretary Building.

W. Childs Hodgens, architect, formerly at 1312 Walnut Street, has moved to 135 South Fifteenth Street, Room 312.

A. R. Van Dyck, architect, recently in Y. M C. A. war work, has opened office at 403 Soo Line Building, Minneapolis.

Robert S. De Golyer, architect, Chicago, has moved his offices from 122 S. Michigan Avenue to 506-76 W. Monroe St.

W. H. Lee, architect of Shamokin, Pa., has opened additional offices at 32 South Seventeenth Street, Phildelphia.

Lunblad & Lunblad, architects, Detroit, have moved from 2060 Penobscot Building to 206 New Telegraph Building.

Root, Hollister, Reeves & Harris have opened offices at 159 North State St., Chicago, as landscape architects and plant specialists.

Frederick S. Stott, architect, has opened an office at 216 Kennedy Building, Omaha, Neb. Mr. Stott was formerly with John McDonald, architect.

Edward F. Hoffman, architect, has opened an office at 1627 Sansom Street, Philadelphia, and would be pleased to receive samples and literature of building materials.

B. Robert Swartburg, architect, New York City, announced removal of his offices from 51 E. 42d Street, to Suite 511, 103 Park Avenue. Samples of woodwork, marble, stone and mosaic are desired.

Louis Baeder, secretary of the Washington State Chapter of the American Institute of Architects, and A. W. Gould, Seattle architects, have been named by Governor Louist Hart as members of the state board of examiners to administer the new architects' licence law. A. J. Russell, formerly of Seattle but now in Tacoma, has also been selected by the governor.

Arno Cammerer, of Washington, has resigned as assistant secretary to the National Commission of Fine Arts. He accepted the appointment as assistant director of the National Parks Service of the Department of the Interior. H. P. Cammerer, formerly with the Postoffice Department, will serve as clerk to the Commission, the office of assistant secretary remaining vacant.

A new organization, to be known as the Service Construction Company, 110 Euclid Avenue, Cleveland, Ohio, has been formed by former department heads of Crowell-Lundoff-Little Co., with Horatio Ford, president; A. Y. Meriam, secretary and treasurer; W. J. Aring, general manager; Alfred G. Hall, designing engineer, and Warren K. Dunn, contracting engineer. They desire manufacturers' samples and catalogues.

News from Various Sources

Dispatch from New York announces the formation of a circuit of theaters exclusively for colored persons.

* * *

Foreign correspondence of New York *Times* states that Lens, the most thoroughly devastated town of the war, is showing signs of revival.

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Postmaster General Burleson announced July 18 that airplane mail hereafter be carried for 2 cents an ounce, same as other first class matter.

* * *

New York State Reconstruction Commission reports construction of 40,000 apartments necessary for city next Fall. Plans are on file for 4,666 apartments.

* * *

Assistant Secretary Post of Labor Department in an address at Washington, July 14, advocated a tax on land values as a means of paying off war debt.

* * *

National Association of Real Estate Boards, in convention at Atlantic City, unanimously agreed in condemnation of American billboard outdoor advertising.

* * *

B. M. Baruch will act as an unofficial business adviser to President Wilson, according to interview reported in Federal Trade Information Service, July 18.

* * *

Philadelphia is preparing to adopt a zoning ordinance similar to that now in force in New York, at the instance of William C. Stanton, City Hall, Philadelphia.

* * *

The Municipality of Portland, Oregon, will engage in the construction of 5000 houses at once as a means of absorbing surplus labor and of utilizing some of the immense lumber supply of that State.

* * *

Wall Street Journal states that North Dakota votes for state industrialism, establishing grain elevators and flour mills, providing for operation of State bank, with $17,000,000 in State bonds for financing plan.

* * *

An apartment house and a hotel exclusively for working women in every large city of the country is one of the planks in the platform of the National Federation of Business and Professional Women in recent convention at St. Louis.

* * *

Complying with the terms of the Army Bill awaiting the President's signature, Secretary Baker issued instructions for discontinuance of all construction work and purchase of real estate for aviation fields, balloon fields and air service schools.

* * *

A voluntary increase of 25 per cent in wages of all employees earning 40 cents an hour or more has been granted by largest manufacturing concerns at Waterbury, Conn. An 8-hour day will be standard working day, and time and one-half will be paid for overtime.

* * *

War Department states that a motor transport train 3 miles long will leave Washington on July 7 for San Francisco over Lincoln Highway. Journey is to be made in 60 days to test efficiency of transport service and demonstrate value of national highways.

Plans are under way for a Pan-Pacific Congress, which it is proposed to hold in Honolulu in the winter of 1920-21, embracing a governmental conference, a commercial conference and a scientific and engineering conference. It will follow the general lines of the Pan-American Congress.

* * *

Governor Smith of New York has approved bill proposing elimination of adult illiteracy in the State. New law appropriates $100,000 for Americanization plan outlined by State Board of Regents. There are about 600,000 persons in State unable to speak English, and about 350,000 who are unable to read or write any language.

* * *

A dispatch from Paris states that the Interallied Council decided July 18 that Gen. E. H. H. Allenby, of the British Army, should take entire charge of the occupation of Asia Minor, with supervision over British, French, Greek and Italian troops. It is believed this settlement would stabilize conditions in Smyrna and other parts of southern Asia Minor.

* * *

It was announced in Paris that the most important medical expedition ever organized to fight typhus will leave Paris shortly to try to stamp out disease in Poland and attempt to avert a threatened epidemic in Central Europe this winter. Col. H. L. Gilchrist, of Medical Corps, U. S. A., will command a group of 550 American Army officers and volunteers, all sanitary experts.

* * *

New York State Industrial Commission, in a report recently issued, states that during the four years since March, 1915, wages have been increased on the average of 107 per cent, and the number of employees 18 per cent. In March, 1919, there were 9 per cent fewer workers in the factories in the State than in the same month in 1917, but the payrolls were 27 per cent larger.

* * *

The office of Director of Air Service announces that the Photographic Branch has started a School of Aerial Photography at Langley Field, Hampton, Va., where recruits will be instructed in photography and allied subjects for four months and then sent either to coastal stations or to flying fields in the United States. Men who enlisted for three years may be sent to Philippine Islands, Hawaii or Panama.

* * *

It is announced from Brussels, July 13, that the Interallied Committee appointed to discuss the question of commemorating war with a permanent monument will recommend the foundation in Belgium of an international city to be known as "Geopolis." The city would be built on one of the sectors of the fighting front of Belgium, which would be neutralized, and would become the permanent seat of League of Nations.

* * *

The Washington *Post* says in an editorial: "The decision of the Chamber of Commerce of the United States to build a permanent home in Washington, with all facilities and equipment for representing American business at the seat of government, is most emphatic evidence of the new attitude of American business men toward the problems that have baffled them heretofore. The decision marks another step forward toward a complete understanding between the Government and business."

Financial and Commercial Digest

As Affecting the Practice of Architecture

Reports Show National Building Is Still On Increase

Expansion is still the order of the day in the building industry, says a Bradstreet report. June reports show a larger total of expenditures than was recorded for the entire list of cities in May, and seem to forecast a total value of house, store and office building larger than was recorded in the most active months of past years. Indeed a maintenance of the percentages of gain so far shown, only 136 cities reporting, would exceed the totals recorded in either July or May, 1916, when building was at its best.

The total expenditure at 136 cities of the United States for June was $111,268,814, an increase of 200.5 per cent over an identical list of cities in June a year ago, fully 4 per cent above the May total at all (163) cities, and 70 per cent larger than in June, 1917. Building for the second quarter of 1919 totals so far $304,555,202, a gain of 118 per cent over a year ago, 35 per cent above the second quarter of 1917.

For the half year the expenditures so far reported are $422,976,820, a gain of 80.3 per cent over the first six months of 1918, and only 16 per cent below the record six months of 1916.

Again Recommend Resale Price Maintenance

WASHINGTON, D. C., July 28.—The Federal Trade Commission in a special report to Congress has renewed its recommendation made last December that manufacturers be permitted by law to fix and maintain resale prices, subject to review by a disinterested agency.

The Commission says that such a law would remove present complexity in the business world, promote the efficiency of manufacturing and commercial institutions and serve the interest of the consuming public.

Under the Commission recommendation, manufacturers desiring to fix and maintain resale prices would file with an agency to be designated by Congress descriptions of their articles, contracts of sale, and the price schedules to be maintained. The disinterested agency would be charged with the duty, "upon complaint of any dealers or consumer or other party at interest," to review the terms of contracts and prices.

Past Year's Export Record Broken

WASHINGTON, D. C., July 26.—Exports from the United States during May were valued at $606,379,599, the Department of Commerce has just announced, while those for June will total close to $680,000,000. This gives us a grand total of $7,000,000,000 exports for the fiscal year, while the imports have passed $3,000,000,000—which also breaks the import record.

The new alignment of foreign trade, predicted by many export specialists, was well shown in the past by our thinking we had the trade "sewed up". We have sold largely to countries which, prior to the war, were but "mildly" interested in our products, while in some of the export markets where we have been in the habit of thinking we had the trade "sewed up," we have barely held our own.

Box Car Shortage May Hinder Shipment of Building Materials

Anticipating a freight car shortage in the near future as soon as the largest wheat crop on record is moved, building material manufacturers are sending out warnings urging the placing of orders for delivery as far ahead as possible. It is said that in view of the fact that there has been no increase in box car equipment for the past few years that conditions will be worse than when the Priority Board stopped shipments of non-essentials. During the next several weeks considerable delays in getting box cars for building materials is expected.

Charge False Statements in Ready-Cut House Advertising Campaign

WASHINGTON, July 28.—The Federal Trade Commission has instituted proceedings against the North American Construction Company, the manufacturers of "Aladdin Ready-Cut Houses." The complaint alleges that the Aladdin Company makes false statements derogatory to its competitors and misleading to the public in the extensive advertising campaigns. The Commission has designated August eleventh as the day for the company's representatives to appear here and show cause why an order to cease and desist from the above practices should not be entered against it.

Architects and builders have an especial interest in the case as the activities of the Aladdin Company have been a source of comment for years. The Federal Trade Commission complains of statements that purchasers of lumber and building materials from the Aladdin Company may effect a full saving of from 35 to 45 per cent of the cost; that local retail lumber dealers add from $300 to $700 for lumber; that lumber purchased from the Aladdin Company is "direct from forest to home"; that a house built from materials purchased from the Aladdin Company costs the purchaser no more than it would if he went direct to the mill at the edge of the forest and purchased his materials; that in buying Aladdin materials the purchaser is not required to pay profits to the jobber, the wholesaler and local retail dealer; that the Aladdin Company by a system of measuring, cutting and fitting employed by it gets 18 per cent more out of a given quantity of lumber than any other builder, which results in that much saving to its customers; that the Aladdin Company sells a better quality of building materials than sold by local dealers; and that the Aladdin Company does not belong to a trust, thereby imputing that local or regular dealers do belong to a trust.

Increased Production Will Reduce Prices*

THE cost of labor and material, which has deterred investment in permanent structures, was a consequence of world currency inflation, world scarcity of men, materials and tools of industry. These and other general economic influences are beyond the control of producers. The cost of labor and materials is a consequence, also, of certain federal complications beyond the control of producers, such as heavy tax burdens and high cost of transportation.

If the causes cannot be cured, the effects and consequences must be accepted.

It is, therefore, important to realize that the effect is the natural consequence of the causes; that the effect is nation-wide, world-wide, and must continue until the causes are eliminated, and that industry cannot be halted, while, as a nation, we wait, like Micawber, for something to turn up, or hope for a legislative open sesame.

The political causes, both foreign and domestic, in their due course, will be settled; but the economic causes can be overcome only through physical production.

During periods of uncertainty labor, the most valuable asset of the nation and the world, is allowed to go to waste. The nation's ultimate asset is human labor and it must be used every hour and every day else it will be, like the water over the dam, lost forever.

Unemployment of labor is caused by lack of human enterprise and initiative in commercial transactions. This lack of initiative has been due, in the past, to an oversupply of one class of commodities in relation to another, so that persons owning the latter were disinclined to exchange it for the former on the new terms.

In 1896 there was an oversupply of commodities in relation to money; cotton brought only 4.6 cents per pound, wheat sold for 42 cents per bushel, hogs brought $4.35 a hundredweight and corn was burned for fuel. To-day there is an oversupply of money in relation to commodities and people are, naturally, disinclined to give up so much money for so little in commodities. Legal tender money in the United States has increased from 776 million dollars in 1873 to 6,741 million dollars in 1918, the latter being 180.3 per cent of the money on hand in 1914. Gold has increased from 135 million dollars in 1873 to 3,075 million dollars in 1918, the latter being 162.7 per cent of the gold on hand in 1914. The increase of currency in relation to commodities during the last four years is greater than that resulting from the Napoleonic wars and greater than that occurring from the year 1700 to 1900; in fact, it is said that the decline in purchasing power of currency during the last four years is equal to the decline during the 400 years from 1300 to 1700.

As the farmers in 1896 were disinclined to produce and exchange so much commodities for so little money, they ceased to produce commodities, burned their corn as fuel, commercial enterprise was paralyzed; labor, unemployed, ceased to produce and ceased to consume normally, and we had little business and Coxey's armies.

Public confidence was restored without the use of a legislative talisman; labor was widely employed, produced and consumed, and has continued to increase the nation's wealth, until the present time. Just prior to the European war, the rate of increase was ten billion dollars a year.

If the foreign, political and economic factors which have caused the high price of labor and materials are beyond our control let us not continue to water the world's balance sheet through delay in undertaking commercial transactions which, ultimately, must be undertaken on a more unfavorable economic basis. Rather let us undertake all prudent commercial transactions, employ labor, increase our nation's real wealth, and reduce the unfavorable ratio now existing between money and commodities. In no other way can the world's dollar slump be halted. This thought is clearly expressed in the following paragraph from a paper entitled "Inflation and Costs," by John J. Arnold, vice-president of the First National Bank of Chicago: "From the standpoint of the student of economics it is absolutely futile for peace industry to wait longer for pre-war commodity prices, and everything should be done to encourage the resumption of peace business, which alone can accomplish what we all desire. In other words, the production of new wealth is absolutely essential for the reduction of costs. The normal way to reduce the price of wheat is through the farms producing a larger quantity."

It is said that the United States possesses more than one-half the tools of industry of the entire world. In a broad sense "tools of industry" include, not only factories and their mechanism, but all forms of structures, railroads, highway and living accommodations. directly or indirectly contributing to production. It is the greater quantity and efficiency of these tools, taken together with American hustle, which created wealth in the United States greater than the sum of wealth in the next five wealthiest nations in the world.

At the beginning of the war the wealth of the United States was in the neighborhod of 265 billion dollars, although the United States was a debtor nation to the extent of about 6 billion dollars as the capital of the old world had sought investments in this country ever since its settlement. We are now a creditor nation to the extent of probably 9 billion dollars. Thus, in the neighborhood of 15 billion dollars' worth of our commodities have been exported during the war period, practically in return for I. O. U.'s. The consequent shortage of commodities and surplus of money particularly affect commodity prices in this country, and so long as we continue to ship commodities abroad and receive I. O. U.'s and not commodities in return, our price level will naturally remain high, and our surplus capital will seek investment abroad rather than in domestic commodity production.

During the war, through deterioration, alteration and lack of replacement, our tools of industry have depreciated, probably to the extent of 3 to 5 billion dollars (an amount nearly coincident with the accretion of our savings deposits in the meantime), and to keep up our industrial efficiency we must not only use our labor but restore our impaired tools of industry to even greater efficiency than that which existed before the war, because we cannot expect the influx of immigration which followed the Civil War and because we already are short 4 million immigrants who would have come to us, under normal conditions. during the war years, as well as about 2 million soldiers not yet demobilized. We must, therefore, have more and better tools to make up for our deficiency in manpower.

Deferred construction after all is a part of our war

*By F. T. Miller, chairman, Financial Operations Committee, National Federation of Construction Industries.

debt to be paid after the war, at an increased cost, and the longer the payment is deferred the greater the cost which must be paid—paid directly for the building and tools constructed, or indirectly in increased rents and cost of living, through the lack of facilities and the inefficiency of the national industrial plant.

While there is little hesitancy in buying those things which can be sold on the present market, "permanent investments" which increase the productiveness of the national plant can be realized on only in future markets, and, therefore, attention is focused on the tendency of prices. People have hesitated to invest in permanent structures believing that "whatever goes up must come down."

When the armistice was signed there was a general belief that pre-war conditions would speedily return and prices would soon fall to the pre-war level. There was, however, but a slight decline from Oct. 1, 1918, to March 1, 1919. Prices since have advanced. The composite index figure on 294 commodities as given by the Bureau of Labor Statistics being for the month of September, 1918, 207; for the month of February, 1919, 197; for the month of March, 200. Prices continued to advance during April, and a preliminary estimate would place the index for that month at 202. It is now generally accepted that the nation is on a permanently higher price level.

It is fortunate, however, that the pre-war dollar will go further in buying structural materials than in buying other less enduring commodities. The prices of structural materials have advanced 84 per cent while general commodities have advanced 113 per cent, and farm commodities have advanced 116 per cent. (The general war advance for all commodities was in the United States 107 per cent, Canada, 115 per cent, the United Kingdom, 133 per cent, France, 235 per cent.)

But the advance in prices of structural materials has taken place in the face of a declining demand, until all structural work was brought to a halt in the fall of 1918; since which time prices have been maintained in the face of little or no demand. Structural wages, outside common labor, had increased up to November, 1918, but 28.5 per cent in the face of a 65.6 per cent increase in the cost of living.

It is inconceivable that a progressive country like the United States will remain permanently in a state of arrested development. The structural industry must be operated on a basis of 20 per cent above normal for a period of about five years to make up the shortage. It is unreasonable to suppose prices of structural materials and labor, maintained and increased throughout the season of declining demand will decrease throughout the boom.

It must be borne in mind that the cost of construction has continually increased during the last generation, and for over 20 years the investors have, from time to time, deferred construction only to be obliged to undertake it at a later date and at increased costs.

And while the standard of living continues to rise, permanent structures and mechanical inventions also will continue to increase in value.

An example of deferred construction costs familiar to all is the proposed New York City court house which was projected in 1909 at a cost of approximately 7 million dollars. During the time spent in purchasing the site, selecting an architect, etc., prices advanced. The cost of construction increased to 9 million in 1913 and 10 million in 1915. Owing to hesitation over prices, the court house is still unbuilt.

If the price tendencies of the past continue, structures will cost no less. The delay and loss of earning power in the meantime will more than offset the unlikely chance of saving through decreased costs of materials and labor.

Many governmental authorities regard the construction industry as the pivotal industry during the reconstruction period, as it restores the impaired national facilities, has earning power, reproductive power, and tax-paying power, and as its activities facilitate the transition of general industry from a war to peace basis.

This industry particularly lends itself to the absorption of labor, temporarily thrown out of adjustment, fixing into permanent wealth what otherwise would be a national daily waste.

Since the Napoleonic régime public works have been resorted to in times of national stress; the excess cost being distributed over the entire community and over a period of years and it is offset by the earning power of the facilities thus created and by taxation on the general industrial activities resulting. The money invested in public work is said to circulate through the country ten times in twelve months and remains in the state, but in a condition of active circulation.

It is believed that no good purpose can be achieved by the continued deferring of necessary public works in which a lack of activity not only halts general industry, but also deprives the public of necessary means for their welfare and convenience.

This is particularly true of highways, and it is profoundly significant that in Illinois—after a thorough investigation of prices and future market prospects, an investigation originating in the belief that prices were arbitrarily high—contracts for 650 miles of state roads have just been let, and the state road building program halted while a commission vigorously endeavored to prove its suspicion of unreasonably high prices now is going ahead.

The investigation was made by a Legislative Committee on Material Cost Investigation and Exhibits. The committee examined the cost of production accounts of producers of brick, cement, lumber, sand, gravel and stone, and made a study of wages, freight rates and the cost of fuel. The substance of the findings of the committee is stated in this paragraph from the report:

"We are driven to the inevitable, logical conclusion that existing prices will not decline materially, and that these prices express a new and substantially permanent level upon which present and future business must be conducted. . . . We believe it to be our duty as public officials to advise the public not to delay building projects in the hope prices will come down materially. We do not believe they will. . . . All contemplated buildings, homes and improvements should be started now. Reconstruction should be accomplished in its real sense by every citizen subscribing to the doctrine: *'Buy Now, Build Now.'*"

This conclusion seems to be based upon the committee's finding that "In the production of building material generally, labor, transportation and fuel constitute at a minimum 75 per cent of the cost of construction," and the investigations of the committee showed no likelihood of the reduction in the cost of labor, freight and fuel.

In Ohio, it is stated, construction of 20 million dollars' worth of new roads will start soon, following the passage during this week of a highway bill which permits a special tax levy for good roads.

Illinois and Ohio road building, like all activities in the field of physical production, will exert a beneficial influence on the general business situation. It was the realization of the importance of road building on our commercial and business life that prompted the Federal Government to appropriate 275 million dollars for federal aid to state road projects, the amount to be spent a dollar for each dollar contributed by the citizens of the several states.

The report of the Illinois Commission, taken in conjunction with the report of the Federal Reserve Board issued May 6, clearly indicates a general acceptance of the opinion that no lower price level is ahead of us for some time. The statement of the Federal Reserve Board referring to the price situation reads as follows:

"Possibly the most conspicuous feature of the whole business situation is found in the fact that prices have apparently been somewhat 'stabilized.' Marked declines are still reported here and there in some special lines, but from nearly all districts it is reported that the uncertainty concerning prices has been mitigated, and that business men now expect that existing levels of prices will be substantially maintained for some time to come. Efforts at Government price fixing are still under consideration, the difficulty of bringing about a definite adjustment in connection with steel, coal and other basic articles having as yet proved insuperable. (Since this statement was made the resignations of the Industrial Board have been accepted, thus apparently bringing the Government's effort at price stabilization to an end.) This leaves those industries without a standard price level recognized by the Government, but with the expectation on the part of dealers that prices will not decline materially below present figures."

It has been suggested we undertake similar protective measures, through tax exemptions of various characters, but the delays and complications of such governmental measures might more than offset their helpfulness and it may be necessary only to go as far as reasonable activity in public works, at the same time removing the war freight embargoes persisting against the building industry by which freight rates were increased from 25 to 150 per cent, leaving in idleness some 350,000 freight cars and a vast number of locomotives headed in the shops. Private initiative is already taking the lead.

The construction industry decidedly is reviving. Building permits throughout the United States were only 6 per cent of normal in November, 1918, in December 10 per cent, January, 1919, 20 per cent, February 40 per cent, March 65 per cent and April 80 per cent. Suburban and country building has been more active in proportion, but the revival is slower in public works, railroad developments, etc.

The world is in an economic welter. Physical production and still more physical production, is the only procedure that will eliminate our commercial and industrial irritation.

Wages are the largest item in the cost of production and the cost of labor is as dependent upon the cost of living as the cost of steam power is on the cost of fuel. Until the shortage of commodities is made up by increased domestic production or by increased imports, there can be no reasonable expectation of decreased cost of living.

Increase in production must come about through increased efficiency of labor, labor-saving devices and improved industrial plant facilities.

There is a world shortage of labor, and its efficiency (always maintaining the capital value of the human machine) can only be increased through hope and understanding.

Methods of production and of distribution in the future must be well nigh revolutionary to approach in progressiveness those introduced between 1865 and 1890, a period marked by the transformation of our entire business structure from hand methods to machine methods, from "pound methods" to "tonnage methods."

It was thirteen years after the Civil War before prices returned to pre-war levels. Then the United States had the world production to draw on, as well as abundant opportunity for the development of new resources and improved methods of production.

It appears that we have arrived at a new price level, and that it is certain there will be no immediate and radical recession. In the building industry there are signs of even higher prices because building materials as a group during the war advanced less than any other group, and because there is a shortage of a year or more's production.

You will assist your country in the struggle toward normal peace-time activity by possessing yourself of all the facts bearing on the economic situation and discussing them fearlessly in private and public. Write what you think; publicity will hasten a general understanding of the situation.

The shortage of commodities will never be made good while, as a nation, we suspect or investigate one another as profiteers, not realizing that we are all, to a greater or less degree, moved by world causes beyond our individual and national control.

We are not responsible for the world war; for the incident world shortage of men, materials and plant; for the heavy tax burdens, or for the world's imperfect political machinery in meeting and adjusting these matters. But we can overcome all these by working together with faith in one another for increased production.

Late Building Material Reports

(From Our Special Correspondent)

CHICAGO, ILL., July 28.—Building operations are practically at a standstill due to the strike of carpenters and other construction workers. Architects, as a result, are finding themselves beset with difficulty in the midst of the greatest building activity this city has seen in many years. The strikers thus far have shown no inclination to those who are financially heavily involved in vast contracts.

Despite the fact that building operations are being held up there appears to be no cessation in the measured advance of material prices. Lumber continues its somewhat puzzling rôle, the price tendency still being upward, though not in the marked degree of the past few weeks. If lumber prices are high now, lumbermen say, it is because retailers and others who let their stocks run low are now desperately sending in orders without caring what they pay as long as they get the lumber. Keeping company with lumber, Chicago brick is advancing in response to similar activity in the East. Other material prices are practically unchanged.

That building operations will go ahead at a rapid rate, once labor troubles are settled, seems to be certain. The building permit list, so far as low cost houses and suburban homes are concerned, shows no decrease. It is work on larger buildings that is temporarily suspended. Labor shortage is also causing unprecedented trouble for employers everywhere, particularly in the building trades.

CHICAGO, ILL., July 26.—Homes for workingmen at cost and abolition of inadequate housing conditions for Chicago's laboring class are the aims of the newly organized Chicago Housing Association, an experiment that is being watched with interest by architects. The association has just purchased a forty-acre tract of land on the south side of the city, where building operations will soon be started.

"The chief aim is to protect the workingman from paying exorbitant profits to private concerns when he builds his home," says James F. Basiger, head of the application department of the association. "It is felt that if it is made

(Continued on page 162-A)

Department of Architectural Engineering

Hooped Concrete Columns with Cast Iron Cores

By L. J. Mensch, *M. Am. Soc. C. E.*

NO one can assert that union and other labor will ever agree to a reduction of wages, and if wages are not reduced there is little hope that the present prices of building materials will ever be lowered to pre-war levels. Therefore, to be successful architects must adopt new construction methods in order to reduce the cost of buildings to figures which are more attractive to the investor.

In all probability reinforced-concrete is going to play a greater rôle than ever before, even in the construction of high office and apartment buildings. In fact this is already taking place.

While in the past, the large sizes of the concrete columns have been a real detriment, thanks to the invention of one of the early pioneers of reinforced-concrete construction, this difficulty is now, in a measure, overcome. A few years ago Dr. F. V. Emperger, of Vienna, made a thorough study and some very exhaustive tests of steel columns stiffened with concrete. He found that the concrete actually stiffened the steel columns so that they failed when the elastic limit of the steel was reached (which limit the particular steel columns tested without the concrete did not reach), and moreover, the concrete contributed an additional strength of approximately 1200 lb. per sq. in. of the effective concrete section. It was also observed that the flow of the steel members, after the elastic limit of the steel was reached, destroyed the concrete and placed a limit on the strength of the concrete at a unit compression of about 0.001 in. per inch.

Next Dr. Emperger conceived the idea that cast iron with its much greater compressive strength and its greater stiffness under high loads would make a more suitable column if reinforced with hooped concrete. Cast iron has a low initial modulus of elasticity, but has no decided elastic limit, which means that the modulus of elasticity decreases only gradually and attains its maximum strength at a unit deformation of approximately 0.02 in. per inch. It is of great importance to note that plain concrete reinforced with longitudinal rods fails at a unit deformation rarely exceeding 0.0015 in. per inch in length, and is, therefore, not in a capacity to help cast iron with its much greater compressibility.

However, hooped concrete can withstand much greater deformations without failure, and besides will prevent the cast iron core from buckling and bursting to such an extent, that Dr. Emperger in some of his tests of this combination column succeeded in developing the entire ultimate strength of cast iron (more than 100,000 lb. per sq. in.), and in addition the entire ultimate strength of the hooped concrete!

The stress strain curves for plain and hooped concrete, also various grades of cast iron and mild steel are shown in Fig. 1. The stress strain curve for plain concrete ends at a unit compression of 0.0015 at which deformation cast iron is stressed to only 15,000 to 25,000 lb. per sq. in. At a unit deformation of the column of 0.01 in. per inch in length, cast iron of ordinary grade will develop stresses from 45,000 to 55,000 lb. per sq. in., while a higher grade of cast iron, such as Dr. Emperger used, will develop stresses of over 80,000 lb. per sq. in., provided the column does not fail by buckling. This is an important point.

To verify these theoretical deductions, and also to supplement the tests made by Dr. Emperger in Europe, another test was conducted by the writer late in the fall of 1916. Twenty columns of various section as shown in Table No. 1 were manufactured. Of these twenty test columns fourteen were of hooped concrete with round cast iron reinforcement, two of similar type but with I section reinforcement, two of hooped concrete without cast iron reinforcement, the remaining two being plain cast iron columns. In the case of hooped concrete columns the concrete was of a 1:1:2 mixture, the columns were

12¾ in. outside diameter, 12 in. core diameter of spiral, reinforced vertically with 0.66 to 1.22 sq. in. of steel bars, and reinforced spirally with No. 8 gage wire at 1⅛ inch pitch, corresponding to 0.61 per cent of core area. The cast iron reinforcement consisted in most cases of 6 in. cast iron columns ¾ in. thick, cast in the ordinary way in a horizontal position.

The columns were tested sixty days after manufacture in the 10,000,000-pound testing machine of the U. S. Bureau of Standards Laboratory in Pittsburgh, Pa., shown in the illustration on page 158. The data and results of the test are clearly shown in Table No. 1. Compression readings were made at six points on the columns for concrete compressions, and at six points for vertical steel compressions. Readings were also taken at three equidistant lines on lengths 12 in. less than the column lengths.

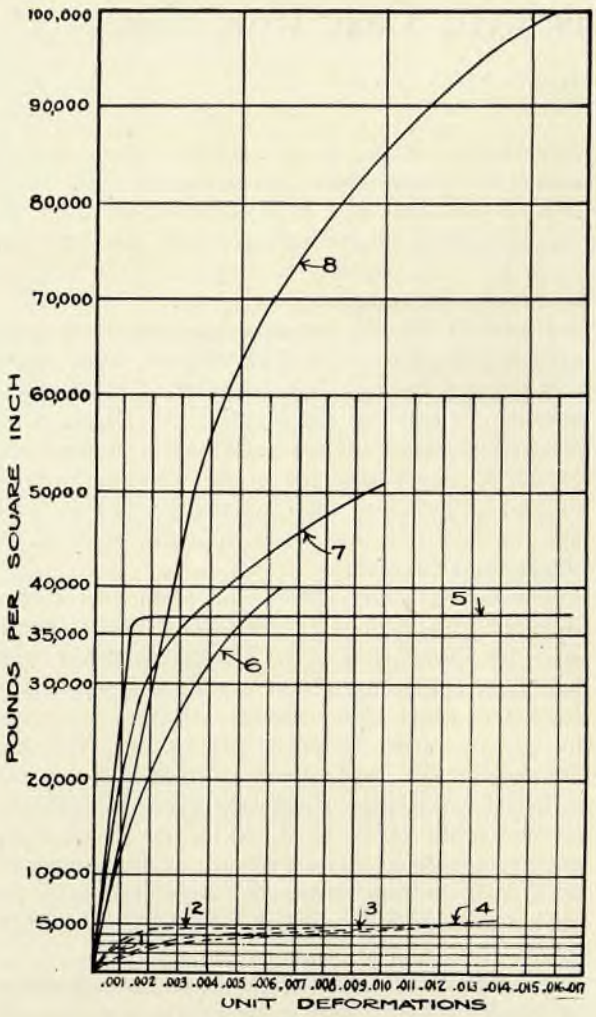


FIG. # 1.

NO 1—PLAIN CONCRETE, U.S. BUREAU OF STANDARDS TEST.
NO.2—HOOPED CONCRETE, .61% SPIRAL REINFORCEMENT, U.S. BU. OF STANDARDS TEST.
NOS. 3+4—HOOPED CONCRETE, 1% AND 2% SPIRAL REINFORCEMENT, McKIBBEN AND MILLER TESTS.
NO.5—MILD STEEL, UNIV. OF ILLINOIS TESTS.
NO 6—CAST IRON, AS USED IN THESE TESTS, U.S. BUREAU OF STANDARDS.
NO 7—CAST IRON, WATERTOWN ARSENAL TESTS.
NO8—CAST IRON, EMPERGER'S TESTS.

Hooped concrete columns without cast iron reinforcement (columns Nos. 7 and 8) showed the first crack at an average pressure of 465,000 lb., equal to 4110 lb. per sq. in., while the corresponding plain concrete test cylinders failed at an average pressure of 3630 lb. per sq. in. The average maximum load carried was 540,350 lb., or 4778 lb. per sq. in., so that in order to find out how much the cast iron cores were stressed in the other columns the assumption was made that the strength of the hooped concrete in all the other columns was also 4778 lb. per square inch and that the remaining load was supported by the cast iron columns.

The ten hooped concrete columns with circular cast iron cores from 8 to 12 ft. in length showed very uniform results. The first crack in the concrete in most cases was noticed at loads of from 500,000 to 800,000 lb., or at one-half to four-fifths of the ultimate load. The unit compression at this time varied from 0.00125 to 0.00175, or practically the same as the compression at which the plain concrete test cylinders failed. At a load of 800,000 lb. considerable spalling of the outer shell occurred, sometimes starting at the top or bottom and again in the center; clearly indicating that the cast iron reinforcement helped to carry the stresses over the weak spot in the concrete. At times one or two spirals burst as the ultimate load was reached, but still the cast iron column helped to distribute the load, and the spirals often burst in quite distant places. Columns Nos. 1 and 2, which were 6 ft. long, showed about 10 per cent more strength than the columns which were 8 to 12 ft. long, while columns Nos. 19 and 20, which were 14 ft. long, showed 10 per cent less strength. Column No. 4 had the space inside of the cast iron core filled with concrete, and showed a considerable increase in strength over the similar column without this extra concrete, from which we may infer that the concrete inside the cast iron core is much more restrained than ordinary hooped concrete.

As a result of these tests the U. S. Bureau of Standards Laboratory derived the following formula for the ultimate strength of hooped concrete columns with cast iron cores (cast horizontally of commercial grade iron) of 1:1:2 mixed concrete, reinforced with 0.61 per cent of spiral and 0.61 per cent of vertical reinforcement, and

TABLE NO. 1.

TESTS MADE BY U.S. BUREAU OF STANDARDS' PITTSBURGH LABORATORY, NOV.-DEC. 1916.

MR. P. H. BATES IN CHARGE — COLUMNS MADE IN CHICAGO BY L. J. MENSCH.

COLUMN NO.	OUTSIDE DIA. OF COL. IN INCHES.	DIA. OF CORE IN INCHES.	AREA OF CONCRETE WITHIN CORE IN SQ. INS.	VERTICAL REINFORCM'T: BARS	VERTICAL REINFORCM'T: AREA IN SQ. INS.	SPIRAL REINFORCEMENT: GAUGE	SPIRAL REINFORCEMENT: PITCH IN INS.	SPIRAL REINFORCEMENT: EQUIV'T PER AREA-SQ. IN. OF FULL CORE AREA	CAST IRON COLUMN: OUTSIDE DIA.	CAST IRON COLUMN: THICKNESS OF SHELL IN INS.	CAST IRON COLUMN: THEORETICAL AREA IN SQ. INS.	CAST IRON COLUMN: PERCENT OF NET CONCRETE AREA	LTH. OF COL. IN FT.	LOAD AT FIRST CRACK IN LBS.	MAXIMUM LOAD IN POUNDS	AVERAGE MAXIMUM LOAD IN POUNDS	LOAD CONSIDERED CARRIED BY: CONCRETE AT 4778 LBS. PER SQ. IN.	LOAD CONSIDERED CARRIED BY: CAST IRON COLUMN: TOTAL	LOAD CONSIDERED CARRIED BY: CAST IRON COLUMN: PER SQ. IN.	LOAD CONSIDERED CARRIED BY: CAST IRON COLUMN: AVERAGE	PROBABLE ACTUAL LOAD PER SQ. IN.	STRENGTH IN LBS. PER SQ. IN. OF 6×12 CYLDR.
1	12 3/4	12	84.8	4-3/8" ϕ 2-1/4" ϕ	.66	#8	1 1/2 c.c.	.89	6	3/4	12.37	14.6	6	436,500	1,057,000	1,041,500	405,000	636,500	51,400	51,400	56,900	4,300
2	"	"	"	"	"	"	" "	"	"	"	"	"	"	776,000	1,026,000							"
3	"	"	"	"	"	"	" "	"	"	"	"	"	8	436,500	940,000		405,000	535,000	43,200	42,700	47,500	3,750
4	"	"	100.7	"	"	"	" "	"	"	"	"	"	"	570,000	1,031,500		481,150	550,350	44,500			"
5	"	"	93.5	"	"	"	" "	"	5	1	12.57	13.4	"	679,000	925,000		446,600	478,400	38,100			4,150
6	"	"	74.6	"	"	"	" "	"	7	5/8	12.52	16.8	"	565,500	920,000		356,300	563,700	45,000			"
7	"	"	113.1	"	"	"	" "	"					10	490,000	518,500	540,350	540,350	0				3,890
8	"	"	"	"	"	"	" "	"					"	440,000	562,200							3,370
9	6	4 1/2							6	3/4	12.37		8		480,000	510,000	0	510,000	41,200		45,500	
10	"	"							"	"	"		"		540,000							
11	12 3/4	12	84.8	"	"	"	" "	"	"	"	"	14.6	10	643,500	911,000	941,375	405,000	536,375	43,400	41,600	46,000	3,750
12	"	"	"	"	"	"	" "	"	"	"	"	"	"	650,000	940,000							"
13	"	"	"	6-3/8" ϕ 2-1/4" ϕ	1.22	"	" "	"	"	"	"	"	"	776,000	896,000							4,250
14	"	"	"	"	"	"	" "	"	"	"	"	"	"	727,500	1,066,500							"
15	"	"	99.7	"	"	"	" "	"	I	See Note	13.4	13.45	"	850,000	1,071,800	1,009,900	476,360	533,540	39,800			"
16	"	"	"	"	"	"	" "	"	I	"	"	"	"	576,000	996,000							"
17	"	"	84.8	4-3/8" ϕ 2-1/4" ϕ	.66	"	" "	"	6	3/4	12.37	14.6	12	732,500	951,500	930,250	405,000	525,250	42,400	42,400	47,000	"
18	"	"	"	"	"	"	" "	"	"	"	"	"	"	630,500	909,000							"
19	"	"	"	"	"	"	" "	"	"	"	"	"	14	630,500	888,500	856,000	405,000	453,000	36,650	36,650	40,500	"
20	"	"	"	"	"	"	" "	"	"	"	"	"	"	679,000	827,500							4,400

* PROBABLE ACTUAL AREA 11.1 SQ. INS.

with cast iron cores of the percentage P and of the ordinary grade as used in the tests:

$$W = 4780\ (1 - P) + 63000\ P - 240\ \frac{L}{D}$$

in which W is the ultimate strength per sq. in.; L is the length and D the diameter of the concrete column.

Table No. 2 (page 160) gives the safe load in tons on this type of column for various sizes. This table is worked out for both a factor of safety of 4 to 5 and 5 to 6. Both values are based on 1:1:2 hooped concrete with 1 per cent of spiral and 1 per cent of vertical reinforcement. In the former (4-5 factor of safety) the stress on the hooped concrete is taken at 1400 lbs. per square inch, and on the cast iron core at 14,000 — 1400 = 12,600 lbs. per square inch. The cores should be of high grade cast iron, cast vertically. In the latter case (5-6 factor of safety) which is in accordance with the ruling of the Chicago Building Department, the stress on the hooped concrete is taken at 1120 lbs. per square inch and on the cast iron core at 11,200 — 1120 = 10,080 lbs. per square inch.

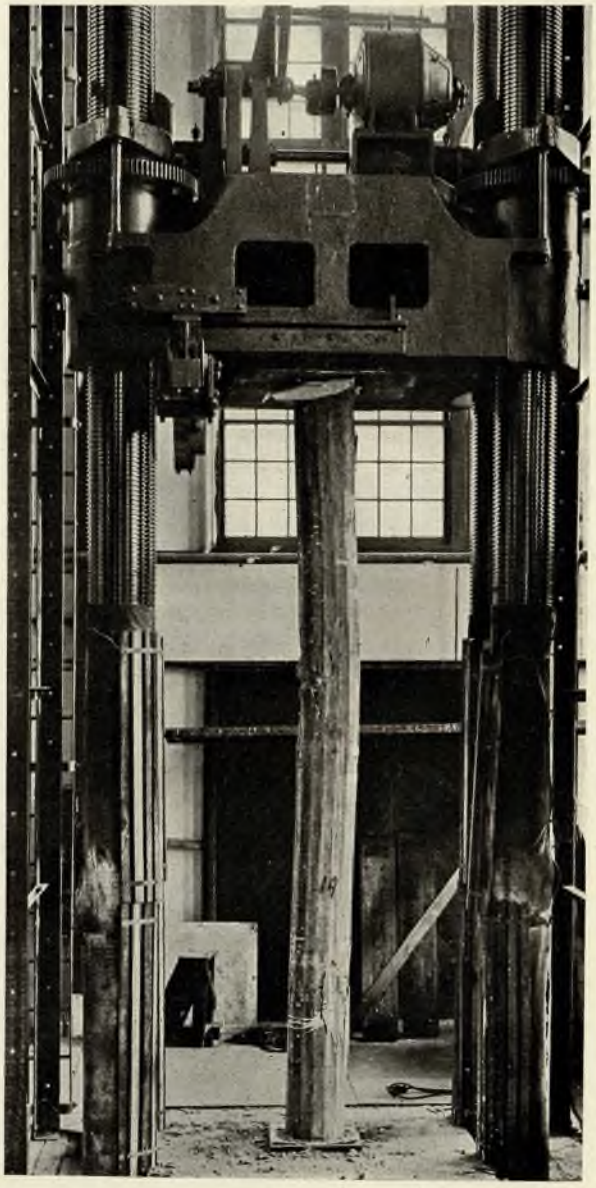
In Fig. 2 (page 159) are shown various details of the cast iron column bases and splices.

The tests made by the Bureau of Standards in Pittsburgh in 1916, and the tests made in Europe by various authorities, did not seem to solve all the mooted questions to the satisfaction of some of the engineers of building departments, and therefore a new series of tests have been made to show more clearly the independence of the strength to the slenderness ratio of the metal core in the hooped concrete column. These tests were also made in order to clearly demonstrate the great value of hooped concrete as a stiffening element of such a core, regardless of whether this core is mild steel or cast iron.

In Fig. 3 (page 161) specimens Nos. 1, 2, 3, 4, 5 and 6 show the test pieces made July 27, 1918, on the grounds of the Armour Institute of Technology of Chicago, which were tested October 29, 1918, under the supervision of Professor G. F. Gebhardt, by Professor P. C. Huntley. A total of six columns were tested. Two columns (Nos. 1 and 2) were standard hooped concrete columns with one per cent of spiral re-inforcing and one per cent of longitudinal steel; the latter consisting of six ¼-in. square rods and two ¼-in. round rods. Two reinforced concrete columns (Nos. 3 and 4) were tested, which had the same spiral and longitudinal reinforcing as the first two columns, with the additional reinforcing of a 2-in. diameter mild steel core placed in the center of the columns. Furthermore, two columns (Nos. 5 and 6) were tested which had the same spiral and longitudinal reinforcing as the first two columns, with the additional reinforcing of a 2-in. diameter cast iron core placed in the center of the column.

In order to figure out what the metal cores tested alone would carry, 2-in. diameter mild steel bars of the same size and length as those used in columns 3 and 4 were tested, and also two 2-in. diameter cast iron cores of the same size and length as those used as cores in columns 5 and 6, were tested separately. The two 2-in. mild steel cores of a slenderness ratio $\frac{l}{r} = 144$ failed at an average ultimate load of 64,000 lbs. or 20,375 pounds per

square inch; the two 2-in. diameter cast iron bars tested singly failed at an average ultimate load of 59,050 lbs. or 18,775 lbs. per square inch; the two standard hooped concrete columns of 1 : 1 : 2 mix failed at a total average load of 193,000 lbs., or approximately 5,010 lbs. per square inch.



TESTING MACHINE, U. S. BUREAU OF STANDARDS, PITTSBURGH, PA.

In order fairly to compare these column strengths with the strengths of the composite columns, we ought to deduct the area of concrete displaced by the 2-in. metal core, and if we do this, we can say that the hooped concrete in the other columns carried a probable ultimate load of 177,300 lbs.

Columns 3 and 4 with a 2-in. mild steel core, failed at an average ultimate load of 354,150 lbs., and deducting the 177,300 lbs. which the hooped concrete in all probability carried, from this value there remains 176,850 lbs., which could only have been carried by the 2 in. steel core in the center of the column. This steel core had an area of only 3.14 square inches, and therefore the ultimate strength of the 2-in. core amounted to 56,300 lbs. per square inch. It is well known that ordinary reinforcing bars placed near the periphery of the spiral rarely contribute more than 35,000 to 40,000 lbs. per square inch at ultimate load, and this test clearly shows the great stiffening action of hooped concrete when the metal is placed in the center of the core. The only explanation for this action which can be offered is that the concrete near the periphery of the spiral is in a more plastic state than in the center of the column, and therefore does not offer the same resistance to the steel bars which are also in a plastic state under the high stress of 35,000 to 40,000 lbs. per square inch.

Columns 5 and 6 with 2-in. diameter cast iron cores failed at an average ultimate load of 345,500 lbs., and deducting the 177,300 lbs. which the hooped concrete carried from this value, there remains a load of 168,200 lbs. which must have been resisted solely by the cast iron core, or 53,500 lbs. per square inch on the area of the cast iron.

Since these steel and cast iron cores contributed 56,300 lbs. and 53,500 lbs. per square inch respectively, to the composite column, or nearly three times as much as when tested separately, it would appear that one of the functions of the hooped concrete seems to be to increase the slenderness ratio of the imbedded metal core to that of the composite column taken as a whole, and indeed, the tests made by the Bureau of Standards prove that the strength of the hooped concrete column with cast iron cores depends on the slenderness ratio of the composite column and not on the slenderness ratio of the cast iron core.

On April 30, 1919, bond tests were made on eight specimens which were prepared on October 29, 1918, and tested by Professor Duff A. Abrams, of the Lewis Institute, Chicago. The test pieces (See Fig. 4, page 162) consisted of 2-in. cores imbedded in hooped concrete cylinders of 12-in. and 24-in. lengths which cylinders were reinforced with one per cent of vertical steel, and one per cent and two per cent of spiral hooping. The cores in the test pieces with one per cent of spiral reinforcing slipped at an average of 915 lbs. and 883 lbs. per square inch, while the cores in the test pieces with two per cent of spiral hooping failed at an average of 1170 lbs. and 1030 lbs. per square inch respectively. These

high bonding values are easily explained since the restraining action of the hooping prevents any splitting up of the concrete, as happens in the ordinary bond tests, and the tests indicate that the higher the percentage of spiral reinforcing the higher is the bond strength between core and concrete. To show the practical importance of this high bonding value, assume a 6-in. cast iron core having a circumference of 18.9 in. or a bonding area of 18.9 square inches for every inch in length. According to these tests for every inch in length this core could transmit to the concrete or the concrete could transmit to the core 17,000 lbs., or in a length of twelve inches an ultimate load of over 200,000 lbs. could be so transmitted. Assuming a factor of safety of 4, a 6-in. diameter core twelve inches long could be figured to safely transmit 50,000 lbs., which is more than any girder twelve inches deep framing into such a column would ever be called upon to transmit.

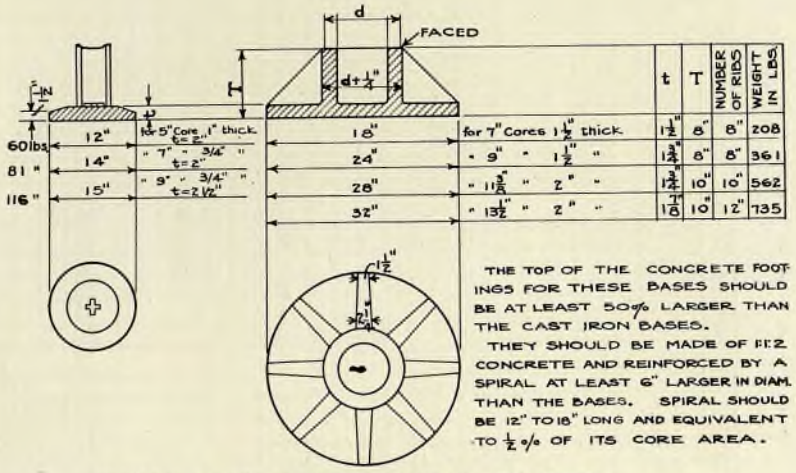
We will now compare the cost of various types of columns designed for a safe load of 700,000 lb., figured according to the Chicago Building Code.

Column No. 1 is a structural steel column, designed for a unit stress of 13,000 lb. per sq. in. on the steel section. This requires a Bethlehem Rolled H Column, 14 inches deep, weighing 187 lb. per lin. ft., which is required to be fireproofed. This may be done with 1:2:4 concrete extending 3 inches on all sides beyond the edge of the steel.

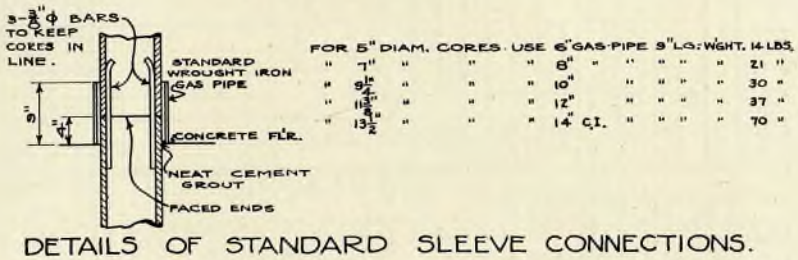
Column No. 2 is also a steel column, but advantage is taken of the Code provision allowing a unit stress of 16,000 lb. per sq. in., on the steel section for structural steel columns which are encased in spirally reinforced concrete extending at least 3 inches beyond the outer edge of the steel. This requires a Bethlehem Rolled H Column, 14 inches deep, weighing 154 lb. per lin. ft., encased in concrete with 1 per cent of spiral reinforcing.

Column No. 3 is a circular reinforced-concrete column designed for a 1:2:4 mix of concrete, with 1½ per cent of spiral hooping. The Code allows a stress of 500 lb. per sq. in. on the effective area of the concrete and in addition an allowance of 281 lb. per sq. in. of the core area, due to the spiral reinforcing, besides 7500 lb. per sq. in. on the vertical reinforcing. For this type a column of 33 inches outside diameter is required with a core diameter of 29 inches and 24 square inches of vertical reinforcing steel.

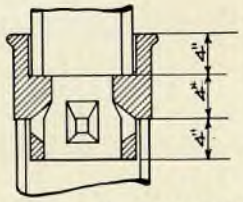
Column No. 4 is similar, but designed for a 1:1:2 mix of concrete with 1½ per cent of spiral hooping. For this rich mix the Code allows a stress of 725 lb. per sq. in. on the effective area of the concrete, and 271 lb. per sq. in. of core area due to the spiral



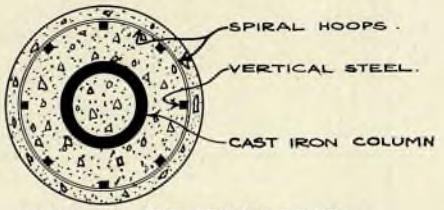
DETAILS OF CAST IRON BASES.



DETAILS OF STANDARD SLEEVE CONNECTIONS.



DETAIL OF REDUCING SLEEVE OF C.I. FOR CONNECTION OF CORES OF DIFFERENT DIAMETER.



TYPICAL SECTION THRU "EMPERGER" COLUMN.

FIG. 2.—TYPICAL DETAILS FOR EMPERGER COLUMNS

SAFE LOADS IN TONS OF 2000 LBS.

· FACTOR OF SAFETY = 5 TO 6 ·

OUTSIDE DIAM. OF CONCRETE COL.	DIAM. OF CORE	AREA OF CORE	REINFORCEMENT SPIRAL SIZE	SPIRAL PITCH	SPIRAL WGHT. IN LBS. PER FOOT	VERTICAL NUMBER	VERTICAL DIAMETER	VERTICAL AREA	VERTICAL WEIGHT	CAST IRON SHELL: LOAD IN TONS ON FULL CORE AREA INSIDE SPIRAL	CAST IRON SHELL: LOAD IN TONS CARRIED BY CAST IRON COLS.	OUTSIDE DIAMETER CAST IRON SHELL: 5" THICKNESS OF	5" AREA OF	5" WGHT. PER FT. OF	7" THICKNESS OF	7" AREA OF	7" WGHT. PER FT. OF	9 1/4" THICKNESS OF	9 1/4" AREA OF	9 1/4" WGHT. PER FT. OF	11 3/8" THICKNESS OF	11 3/8" AREA OF	11 3/8" WGHT. PER FT. OF	13 1/2" THICKNESS OF	13 1/2" AREA OF	13 1/2" WGHT. PER FT. OF
12"	8"	50.26	7/16"	1 1/8"	2.2	8	3/4"	.88	3.62	28	35	1/2"	7.1	22.2	5/8"	8.6	26.9	3/4"	10.0	31.3	7/8"	11.4	35.7	1"	12.8	39.6	1 1/8"	13.7	42.8
14"	10"	78.5	7/16"	1.0"	3.2	8	3/4"	.88	3.62	44	CU. FT. OF CONCRETE PER LINEAR FOOT IN COLUMNS-	5/8"	7.1	22.9	3/4"	8.6	26.9	7/8"	10.1	31.3	1"	11.5	35.7	1 1/8"	12.9	39.6	1 1/4"	13.7	42.8
16"	12"	113	7/16"	1.0"	4.4	8	3/4"	1.13	4.7	63	ROUND	5/8"	7.1	22.9	3/4"	8.6	26.9	7/8"	10.1	31.3	1"	11.5	35.7	1 1/8"	12.9	39.6	1 1/4"	13.7	42.8
18"	14"	154	1/2"	1.0"	5.8	8	7/8"	1.57	6.4	86	1.77	2.25	121	129	136	143	149	162	137	149	160	170	181	191	200	209	217	155	170	186
20"	16"	201	1/4"	1 1/4"	7.4	8	1"	2.02	8.2	112	2.18	2.78	148	156	162	170	176	189	164	175	186	197	207	217	226	235	243	181	197	213
22"	18"	254.5	1/4"	1 1/8"	9.2	8	1"	2.46	10.1	142	2.64	3.37	178	186	192	200	206	219	194	205	216	227	237	247	256	265	273	212	227	243
24"	20"	314	1/4"	1.0"	11.2	8	1"	3.14	12.9	176	3.14	4.00	211	219	226	233	239	252	227	239	250	260	271	281	290	299	307	245	260	276
26"	22"	380	5/16"	1 1/16"	13.5	8	1"	3.55	14.5	212	3.70	4.70							264	275	286	297	307	317	326	335	343	281	297	313
28"	24"	452	5/16"	1 1/16"	16.0	8	1"	4.50	18.4	252	4.30	5.45							304	315	326	337	347	357	366	375	383	311	327	353
30"	26"	531	5/16"	1 1/4"	18.6	8	1"	4.81	18.7	296	4.91	6.25							348	359	370	381	391	401	410	419	427	345	361	381
32"	28"	615.8	5/16"	1 1/8"	21.5	10	1"	6.01	24.7	344	5.60	7.10							395	407	418	428	439	449	458	467	475	413	428	444
34"	30"	707	3/8"	1.41"	24.6	10	1"	7.66	31.4	395	6.30	8.03								458	469	480	490	500	509	518	526	464	480	496
36"	32"	804	3/8"	1.4"	28.0	10	1"	7.85	32.1	450	7.10	9.00									534	545	555	564	573	581		519	534	550
38"	34"	908	3/8"	1.3"	31.4	12	1"	9.18	37.5	507	7.80	10.00										607	617	627	636	644	652	576	592	608
40"	36"	1018	3/8"	1.23"	35.0	14	1"	10.7	43.9	570	8.75	11.10											675	684	693	701		670	686	700
42"	38"	1134	3/8"	1.16"	33.0	14	1"	11.0	45.0	635	9.62	12.25																735	751	765
44"	40"	1256	7/16"	1.50"	43.0	16	1"	12.6	51.5	700	10.60	13.50																		830
46"	42"	1385	7/16"	1.44"	48.0	18	1"	13.8	56.5	775	11.60	14.70																		
48"	44"	1520	7/16"	1.36"	52.0	20	1"	15.3	62.5	850	12.60	16.00																		

· FACTOR OF SAFETY = 4 TO 5 ·

OUTSIDE DIAM. OF CONCRETE COL.	DIAM. OF CORE	AREA OF CORE	REINFORCEMENT SPIRAL SIZE	SPIRAL PITCH	SPIRAL WGHT. IN LBS. PER FOOT	VERTICAL NUMBER	VERTICAL DIAMETER	VERTICAL AREA	VERTICAL WEIGHT	LOAD IN TONS CARRIED BY C.I. COLUMN	CAST IRON SHELL: LOAD IN TONS ON FULL CORE AREA INSIDE SPIRAL	OUTSIDE DIAMETER CAST IRON SHELL: 5" THICKNESS OF	5" AREA OF	5" WGHT. PER FT. OF	7" THICKNESS OF	7" AREA OF	7" WGHT. PER FT. OF	9 1/4" THICKNESS OF	9 1/4" AREA OF	9 1/4" WGHT. PER FT. OF	11 3/8" THICKNESS OF	11 3/8" AREA OF	11 3/8" WGHT. PER FT. OF	13 1/2" THICKNESS OF	13 1/2" AREA OF	13 1/2" WGHT. PER FT. OF
12"	8"	50.26	7/16"	1 1/8"	2.2	8	3/4"	.88	3.62	35	.80	1.00	44	54	63	71	79	86	64	78	92	105	118	131	142	151	163	86	105	126
14"	10"	78.5	7/16"	1.0"	3.2	8	3/4"	.88	3.62	55	1.07	1.36	73	89	98	106	114	121												
16"	12"	113	7/16"	1.0"	4.4	8	3/4"	1.13	4.7	79	1.40	1.78	123	133	142	150	158	165	143	157	171	184	197	210	221	230	242			
18"	14"	154	1/2"	1.0"	5.8	8	7/8"	1.57	6.4	107	1.77	2.25	152	161	170	179	188	193	171	186	200	213	225	236	246	258	271	193	213	233
20"	16"	201	1/4"	1 1/4"	7.4	8	1"	2.02	8.2	140	2.18	2.78	185	194	203	212	219	226	204	219	233	246	258	271	282	291	304	224	246	269
22"	18"	254.5	1/4"	1 1/8"	9.2	8	1"	2.46	10.1	158	2.64	3.37	222	232	241	249	257	264	222	236	250	263	276	289	300	309	321	264	283	304
24"	20"	314	1/4"	1.0"	11.2	8	1"	3.14	12.9	219	3.14	4.00	264	273	282	291	298	305	283	298	312	325	337	350	361	370	380	305	325	345
26"	22"	380	5/16"	1 1/16"	13.5	8	1"	3.55	14.5	266	3.70	4.70							330	344	358	371	384	397	408	417	429	352	371	392
28"	24"	452	5/16"	1 1/16"	16.0	8	1"	4.50	18.4	315	4.30	5.45							379	394	408	421	433	446	457	466	479	401	421	441
30"	26"	531	5/16"	1 1/4"	18.6	8	1"	4.81	18.7	371	4.91	6.25							435	449	463	476	489	502	513	522	534	458	476	497
32"	28"	615.8	5/16"	1 1/8"	21.5	10	1"	6.01	24.7	430	5.60	7.10							494	508	522	535	546	556	567	574	581	516	535	556
34"	30"	707	3/8"	1.41"	24.6	10	1"	7.66	31.4	495	6.30	8.03							555	573	587	600	613	626	637	646	658	581	600	621
36"	32"	804	3/8"	1.4"	28.0	10	1"	7.85	32.1	562	7.10	9.00							626	641	655	668	680	693	704	713	726	648	668	688
38"	34"	908	3/8"	1.3"	31.4	12	1"	9.18	37.5	635	7.80	10.00										740	753	766	777	786	798	717	740	761
40"	36"	1018	3/8"	1.23"	35.0	14	1"	10.7	43.9	712	8.75	11.10												841	854	863	876			857
42"	38"	1134	3/8"	1.16"	33.0	14	1"	11.0	45.0	795	9.62	12.25																		
44"	40"	1256	7/16"	1.5"	43.0	16	1"	12.6	51.5	880	10.60	13.50																		
46"	42"	1385	7/16"	1.44"	48.0	18	1"	13.8	56.5	970	11.60	14.70																		
48"	44"	1520	7/16"	1.36"	52.0	20	1"	15.3	62.5	1064	12.60	16.00																		

TABLE NO. 2.—SAFE LOADS ON EMPERGER COLUMNS

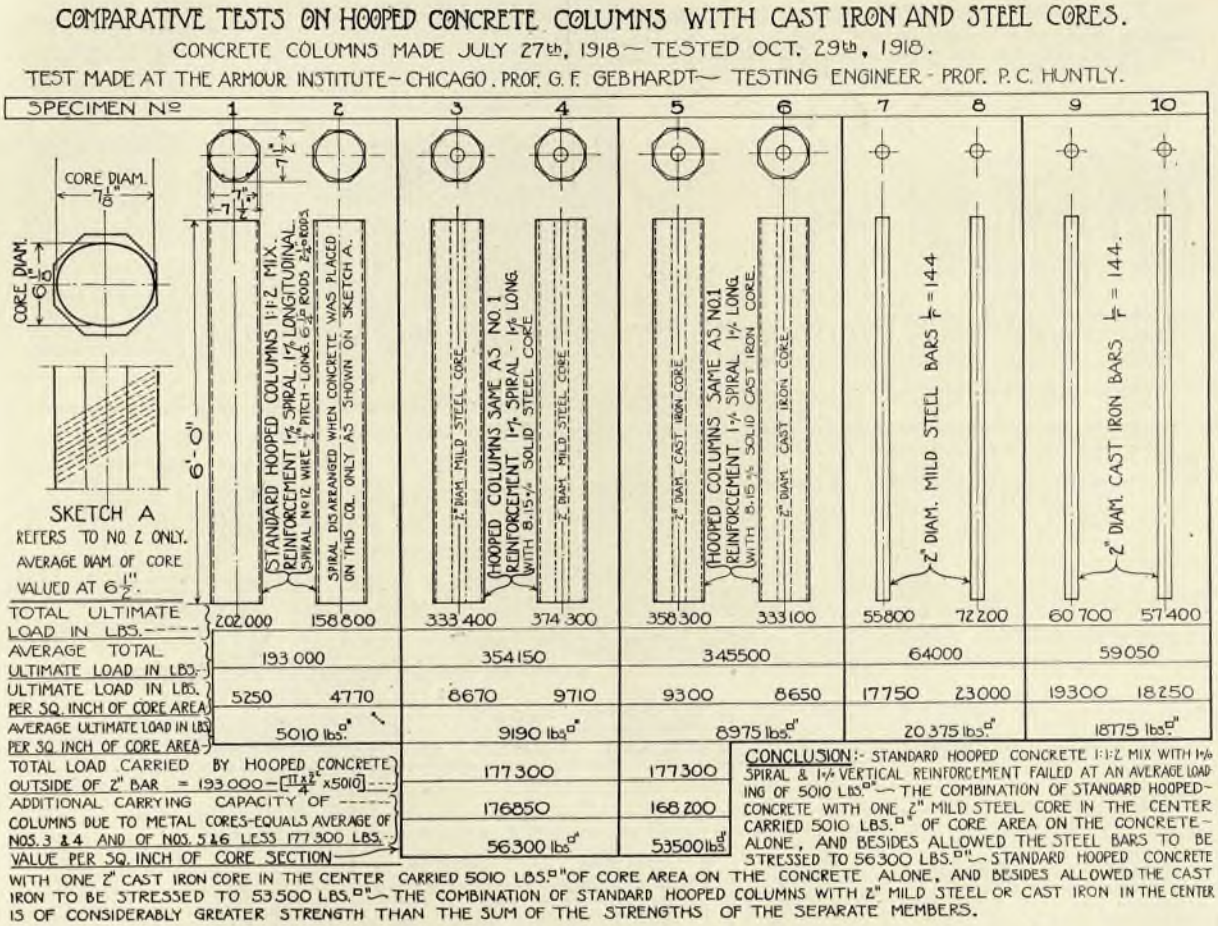


FIG. 3.—RESULTS OF COMPRESSION TESTS

reinforcing, besides 7250 lb. per sq. in. on the vertical reinforcing. A column 32 inches outside diameter is required, with a core diameter of 29 inches and 12 square inches of vertical reinforcing steel.

Column No. 5 is an Emperger Column of 20 inches outside diameter and 16 inches core diameter, having 1 per cent of spiral and 1 per cent of vertical reinforcement, with a cast iron core of 9¼ inches outside diameter 1⅜ inches thick. This is taken from Table No. 2 under a factor of safety of 4 to 5.

Column No. 6 is also an Emperger Column of 26 inches outside diameter and 22 inches core diameter, having 1 per cent of spiral and 1 per cent of vertical reinforcing, with a cast iron core of 7 inches outside diameter ¾ in. thick, also taken from Table No. 2.

For the purpose of making a comparison of the cost of these various types we shall assume the following unit prices:

1:2:4 Stone Concrete (in place) 32 cents per cu. foot.

1:1:2 Stone Concrete (in place) 44 cents per cu. foot.

Spiral and Vertical Reinforcing steel (in place) 4 cents per pound.

Structural Steel (erected) 5 cents per pound.

Cast Iron Cores (in place) 4 cents per pound.

Forms (in place) 20 cents per square foot.

The quantities and costs based on the foregoing data are tabulated in Table No. 3. A study of this table shows that Emperger Column No. 6 is easily the most economical column, the cost being only one-half that of standard structural steel column No. 1 which is the most expensive. It will also be noted that column No. 1 when fireproofed has outside dimensions of approximately 21 in. by 22 in., while column No. 6 is only slightly larger, being 26 inches in diameter. Emperger Column No. 5 is but 20 inches in diameter and therefore takes up less space than the

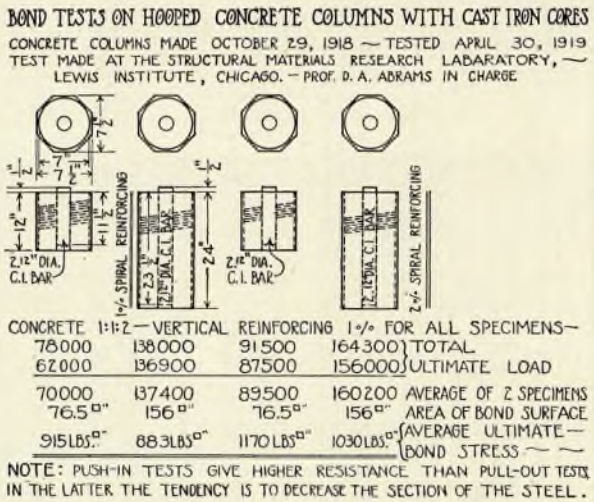


FIG. 4.—RESULTS OF BOND TESTS

structural steel column (No. 1) while costing but 59 per cent as much. Column No. 3 is much larger and costs 50 per cent more than Column No. 6.

From this data the economy of the Emperger Column is clearly set forth, and its adoption in a twelve-story building containing fifty columns should cause a saving of approximately $20,000 over the structural steel column of the type marked No. 1 in Table 3.

From the foregoing it would seem that there are great possibilities for the hooped concrete column reinforced with a cast iron core, due to the permissible reduction of the size of the columns. In conclusion one specific case to illustrate the necessity of keeping the size of the columns down to a minimum will be mentioned. During the war a warehouse building was laid out in steel, and the cost being excessive, it was re-designed in reinforced concrete. In the lowest story the columns were some four feet square. The saving in cost was $80,000, but after completion the owner computed the space lost due to the excessive size of the columns at $12,000 per year. Thus it is doubtful if any real economy was practised, since the entire amount saved in the original investment would be lost in income in less than seven years.

TABLE No 3.

COST COMPARISON FOR VARIOUS TYPES OF COLUMNS

COLUMN NO.	1		2		3		4		5		6	
MIXTURE OF CONCRETE	1:2:4		1:2:4		1:2:4		1:1:2		1:1:2		1:1:2	
NOTES:- SAFE LOAD FOR ALL COLUMNS 350 TONS. COLUMNS 1 TO 4 ARE DESIGNED — ACCORDING TO CHICAGO BLD'G CODE. QUANTITIES AND COST ARE GIVEN FOR ONE LINEAR FT. OF COLUMN.	BETHLEHEM H COL. 187 lb		BETHLEHEM H COL. 154 lb		19-1⅛" ϕ BARS-AREA=24"		12-1" ϕ BARS-AREA=12"		C.I. COL. 9½" DIAM. ⅜" THICK		C.I. COL. 7" DIAM. ¾" THICK	
	QUANTITY	COST	QUANTITY	COST	QUANTITY	COST	QUANTITY	COST	QUANTITY	COST	QUANTITY	COST
CONCRETE	2.7 CU.FT.	$0.86	2.6 CU.FT.	$0.83	5.8 CU.FT.	$1.86	5.5 CU.FT.	$2.42	2 CU.FT.	$0.88	3.6 CU.FT.	$1.58
REINFORCEMENT			13.6 LBS.	0.54	127 LBS.	5.08	78 LBS.	3.12	15.6 LBS.	0.62	28 LBS.	1.12
FORMS	7 SQ.FT.	1.40	7 SQ.FT.	1.40	9 SQ.FT.	1.80	8.7 SQ.FT.	1.74	5.5 SQ.FT.	1.10	7 SQ.FT.	1.40
STRUCTURAL STL.	187 LBS.	9.35	154 LBS.	7.70								
CAST IRON CORES									106 LBS.	4.24	46 LBS.	1.84
TOTAL COST	$11.61		$10.47		$8.74		$7.28		$6.84		$5.94	
PERCENTAGE	100%		90%		75%		63%		59%		51%	
PROBABLE FACTOR OF SAFETY —	3 1/2		3		4 1/2		4 1/2		4 1/2		4 1/2	

Late Building Market Reports

(*Continued from page 154*)

easy for the worker to own his own home, bad housing conditions will soon disappear."

Prominent architects have volunteered to design houses without fee, and a large city bank will serve in collecting and recording installment payments, free of charge to the association. Among the directors of the new organization are J. Ogden Armour and William Wrigley, Jr.

Building is Active

The *Journal of Commerce* reports that building contracts awarded during the first half of 1919 in that portion of the United States east of the Mississippi River and north of the Ohio River, totalled $989,904,000. This indicates an increase in volume of operations of 23 per cent over the average volume for similar periods of the five years preceding 1919. This notable increase has taken place in spite of the many conditions which at the opening of the year were looked upon as deterrents to building.

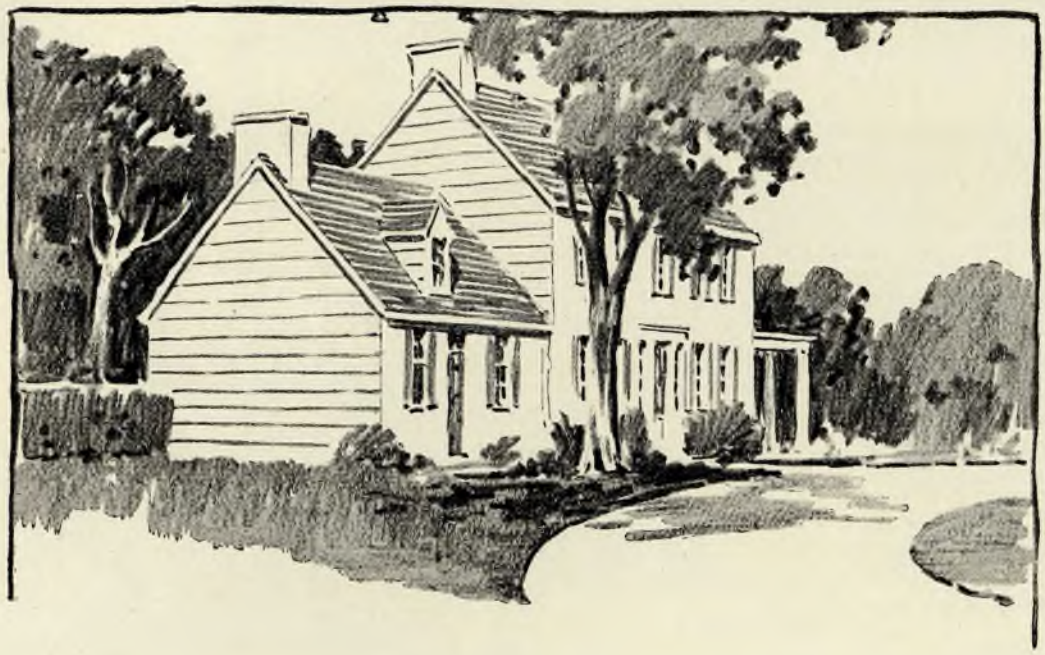
Late Quotations in Building Material Markets

(Price quotations now current on building materials and supplies as quoted by dealers and jobbers for delivery in New York and Chicago follow. The quotations set forth are placed before readers of THE AMERICAN ARCHITECT to afford an accurate review of market conditions rather than for use as a basis for actual purchase. They will not only provide knowledge of the exact state of the market as to items quoted, but will also present a basis to judge conditions as affecting correlating materials. Items marked (*) indicate an advance over last week, while those marked (†) record a decline. Other prices did not fluctuate during the week.)

BRICK	New York	Chicago
Face brick (delivered on job):		
Common (Delivered at job in Borough of Manhattan only), per thousand	$17.85	$12.00
Rough red	29.00	40.00
Smooth red	26.00	40.00
Rough buff	32.00	40.00
Smooth buff	32.00	40.00
Rough gray	38.00	42.00
Smooth gray	40.00	42.00
Colonials	24.00	30.00
BROKEN STONE		
(Delivered on job):		
1½ in. per cu. yd	$2.75	$2.25
¾ in. per cu. yd	2.75	2.25
BURNED CLAY		
(Delivered on job)		
Block partition:		
3 in., per sq. ft	.13	.10
4 in., per sq. ft	.15	.11
Chimney tops:		
12 x 12 for 8 x 8 flues	$3.50	$2.25
Flue lining:		
4½ ft. x 13 ft., per lin. ft	.24	.12
4½ x 8½, per lin. ft	.18	.16
8½ x 8½, per ft	.24	.16
8½ x 13, per ft	.35	.20
13 x 13, per ft	.60	.45
8½ x 18, per ft	.60	.50
13 x 18, per ft	.95	.75
18 x 18, per ft	1.25	.85
Wall coping (double slant):		
8 in., per lin. ft	.18	.14
12 in., per ft	.33	.26
18 in., per ft	.54	.30
Wall coping (single slant):		
8 in., per lin. ft	.16	.14
12 in., per ft	.26½	.30
18 in., per ft	.54	.30
(Corners and angles four times the price of one foot of coping the same size.)		
Hollow Tile		
(Delivered at job, in New York below 72nd St.)		
2 x 8 x 12 partitions, per 1,000 sq. ft	$70.15	....
3 x 12 x 12 partitions, per 1,000 sq. ft	102.00	$67.90
4 x 12 x 12 partitions, per 1,000 sq. ft	114.75	72.50
6 x 12 x 12 partitions, per 1,000 sq. ft	153.00	99.60
8 x 12 x 12 partitions, per 1,000 sq. ft	....	135.80
10 x 12 x 12 partitions, per 1,000 sq. ft	....	167.50
12 x 12 x 12 partitions, per 1,000 sq. ft	....	194.60
2 x 12 x 12 split furring, per 1,000 sq. ft	63.75	45.30
CEMENT		
Per bbl. in 20 cent bags (Rebate 80c. per bbl. for bags)	$3.45	$3.45
COPPER SHEETS		
At the mill, hot rolled, 16 oz. base-price, per lb	32½c.*	32½c.*
(From jobber's warehouse add 2 to 3 cents.)		
Cold rolled per lb	34 c.*	34 c.*
From stock in 100 lb. lots and over	34½c.	to 36½c.*
For less than 100 lb. lots 2c. per lb. advance.		
Polished, 20 in. wide and under, 1c. per sq. ft. extra; over 20 in. wide, 2c. per sq. ft. extra. Planished, 1c. per sq. ft. more than polished.		

	New York	Chicago
Bottom, pits and flats, 1 oz. and heavier, per lb	41c.	41c.
Tinning one side, per sq. ft	.06c.	.06c.
CORNER BEAD		
Per foot	.05	.05
FIBRE		
Per bushel	.36	.30
FINISHED IRON AND STEEL		
(Mill Shipments)		
Bar iron, refined grade	2.62c	2.35
Bar iron, double refined	3.62c	....
Soft steel bars	2.62c.	....
Shapes	2.72c.	....
Plates	2.92c.	2.65c.†
GALVANIZED SHEETS		
No. 18 and 20 gauge, per lb	$6.00	$6.12
No. 26	6.30	6.42
No. 27	6.45	6.57
Structural shapes	....	3.47c.
GLASS		
(Discounts from manufacturer's price lists)		
Single strength, A quality, first three brackets	77%	77%
Single strength, B quality	77%	77%
Double strength, A quality	79%	79%
Double strength, B quality	81%	81%
Plate—up to 5 sq. ft	82%	80%
Plate—over 5 sq. ft	84%	80%
Plate—up to 10 sq. ft	...	80%
Plate—over 10 sq. ft	...	80%
Polished plate glass (commercial run of thickness and quality) sizes to 5 sq. ft., inclusive	80%	....
Sizes over 5 sq. ft	82%	....
GRAVEL		
1¼ in. (Borough of Manhattan only), per cu. yd	$2.75	$2.30
¾ in. (Borough of Manhattan only), per cu. yd	2.75	2.30
GYPSUM		
Plaster Board: Delivered at job, Boroughs of Manhattan and Bronx.		
27 x 28 x 1	37c.*	....
27 x 48 x ½	34c.*	....
32 x 36 x ¼	22c.*	25c.
32 x 36 x ⅜	22c.*	26c.
32 x 36 x ½	24½c.*	....
Plaster Blocks: Delivered at job, Boroughs of Manhattan and Bronx.		
2 in. sold, 12 x 30, per sq. ft	11c.*	....
3 in. hollow, 12 x 30, per sq. ft	11c.	10c.
4 in hollow, 12 x 30, per sq. ft	12½c.	....
6 in. hollow, 12 x 30, per sq. ft	18c.	....
LATH		
Eastern spruce, per thousand	$7.50*	....
No. 1 white pine, per thousand	....	$7.50
No. 1 hemlock, per thousand	....	6.50
No. 1 yellow pine, per thousand	7.50*	....
LEAD		
American pig, per lb	6 to 6½	6¼ to 6½*
Bar, per lb	7½ to 8½	6½ to 6¾*
LIME		
Common, 300 lb. bbls., per bbl	$2.50	$1.40
Finishing, 300 lb. bbls., per bbl	3.70	....
Hydrated, in paper bags, per ton	18.50	18.25
Hydrated finishing, in cloth bags, per ton (rebate 20c. per bag)	....	22.60
LUMBER		
(Retail prices per M, delivered.)		
Yellow pine, 2 x 4	$67.50	$52.00
Yellow pine, 2 x 6	65.00	50.00
Yellow pine, 4 x 4	70.00*	55.00
Yellow pine, 8 x 8	67.50	60.00

(*Continued on page 162-B*)



G-E Vulcanized Rubber Insulated Conductors

Single conductor stranded tape and single braid rubber-insulated cable. Furnished in sizes from 250 000 c. m. to two million c. m.

VULCANIZED rubber compound is the only practical waterproof insulation used on electrical conductors. For years this company has standardized on three grades. In order of their quality, these are respectively:

Red Core, the G-E standard commercial grade, a compound exceeding all requirements of the National Electrical Code and especially adapted to house wiring,

Tricoat, somewhat better than Red Core, but not equal to Thirty-per-cent.

Thirty-per-cent compound containing 30 per cent by weight of dry Hevea rubber, suitable for severe service and high voltages and complying with the specifications of the Association of Rubber Covered Wire Engineers.

Any of the standard finishes may be applied to rubber-insulated conductors.

General Electric Company

General Office Schenectady, N.Y.

37-4

Late Building Material Prices

(*Continued from page* 162-A)

	New York	Chicago
Yellow pine, 12 x 12	75.00	62.50*
Yellow pine, No. 1 boards, 1 x 6	75.00	60.00*
Yellow pine, No. 1 boards, 1 x 12	80.00	65.00*
Yellow pine, B and better flooring (plain)	80.50*	72.00
Yellow pine, B and better flooring (quartered)	100.00	85.00*
Douglas fir, 6 x 6 to 12 x 12	67.50	60.00
Douglas fir, 12 x 12 to 14 x 14	77.50*	68.00*
Norway pine, 2 x 4	60.00	55.00
Norway pine, 2 x 12	72.50*	62.00
Hemlock, 2 x 4	57.50	52.00
Hemlock, 2 x 12	60.00	54.00
Oak flooring, 13/16 quartered white	200.00	160.00*
Oak flooring, 13/16 quartered red	190.00	143.00
Oak flooring, 13/16 plain white	125.00	105.00
Oak flooring, 13/16 plain red	125.00	105.00*
Maple, 1" F. A. S.	85.00	80.00
Basswood, 1" F. A. S.	88.00*	80.00
Maple flooring, 13/16 clear	95.00*	85.00
Maple flooring, 13/16 select	85.00	82.00
Maple flooring, 13/16 No. 1 factory	75.00	62.00
Mahogany, 1" F. A. S.	300.00	300.00
Quartered oak, 1" F. A. S.	200.00	185.00
Plain oak, 1" F. A. S.	130.00	110.00
Red gum, 1" F. A. S.	100.00*	90.00
Sap gum, 1" F. A. S.	72.50*	65.00
Chestnut, 1" F. A. S.	95.50*	100.00
Poplar, 1" F. A. S.	135.00	115.00
Birch, 1" F. A. S.	85.00	80.00
Spruce, random 2"	60.00	55.00
Spruce, wide 8"	65.00	60.00
Spruce, 10"	70.00	65.00
Spruce, 12"	75.00	70.00

METAL LATH

Under 100 sq. yd., per sq. yd	40c.	35c.

MORTAR COLORS

Red, per lb	.05	.05
Brown, per lb	.05	.05
Chocolate, per lb	.05	.05
Black, per lb	.05	.05

OILS

Linseed, city, raw	$2.20*	$2.11
Linseed, boiled, advance, per gal	.01	.02
Out of town, American seed, at	2.20*	2.11

PAINTS

Leads:		
American white, in oil, kegs; lots over 100 lbs	13c	13c.
White, in oil, 25-lb. tin pails; add to keg price	¼c.	¼c.
Red, bbl., ½ bbl. and kegs; lots over 100 lbs	13c.	14c
Dry Colors:		
Red Venetian, American, per 100 lbs.	$2.00 to $4.50	$2.00 to $4.00
Metallic Paints:		
Brown, per ton	$32.00 to $36.00	$24.00 to $32.00
Red, per ton	35.00 to 40.00	24.00 to 32.00

PIPE

Cast Iron:		
6 in. and heavier	$50.00 to $52.30	$56.80*
4 in.	53.00 to 55.00	59.80*
3 in.	60.00 to 62.30	68.80*

(and $1 additional for Class A and gas pipe.)

(Discounts to jobbers for carload lots on the Pittsburgh basing card; freight rates from Pittsburgh to New York, and also from Pittsburgh to Chicago, in carloads, per 100 lbs., are 27c. An additional 5 per cent discount is allowed to large jobbing interests over those listed below.

Wrought:	F.O.B. Pittsburgh	F.O.B. Chicago
Steel: Butt Weld		
Black, ⅛ to 3 in.	50½ to 57½%	42.6 to 49.6%
Galv., ⅛ to 3 in.	24 to 44 %	14.6 to 34.6%*
Iron:		
Black, ⅛ to 1½ in.	29½ to 39 %	19.6 to 29.6%†
Galv., ⅛ to 1½ in.	2½ to 23½%	9.4 to 11.6%†
Steel: Lap Weld		
Black, 2½ to 6 in.	53½%	45.6%
Galv., 2½ to 6 in.	41 %	31.6%
Iron:		
Black, 2½ to 6 in.	34½%	24.6%
Galv., 2½ to 6 in.	21½%	9.6%*
Butt Weld, Extra Strong, Plain Ends		
Steel:		
Black, ⅛ to 3 in.	46½ to 56½%	33 to 43 %*
Galv., ⅛ to 3 in.	29 to 44 %	10.6 to 18 %*
Iron:		
Black, ⅛ to 1½ in.	28½ to 39½%	.....
Galv., ⅛ to 1½ in.	11½ to 24½%	.....
Lap Weld, Extra Strong, Plain Ends		
Steel:		
Black, 2 to 6 in.	48¼ to 50½%	35 to 37%*
Galv., 2 to 6 in.	37 to 39 %	10 to 12%*
Iron:		
Black, 1¼ to 6 in.	25½ to 34½%	.....
Galv., 1¼ to 6 in.	10½ to 22½%	.....

PLASTER

	New York	Chicago
Neat wall cement in 15 cent bags, per ton	$21.30	$19.50*
Finishing plaster	24.00	22.00*
Lath mortar, in cloth bags, per ton	15.05	....

PUTTY

In bladders, per 100 lb.	$6.25	$4.25
In 1-lb. to 5-lb. tins, per 100 lb.	6.75	6.50

RADIATION

(A further discount, effective April 4, of 15% on direct radiators, 12½% on wall radiators, and 10% on steam and hot water boilers is announced. This approximates a drop of 36% on radiators and 33% on boilers from prices in effect before the 1st of January, 1919.)

Chicago reports a 57% discount on standard heights.

REGISTERS

Cast iron semi-steel or steel, in black or white japan or electro plate and small faces and borders	40%	40%
Wall frames	40%	40%
Large faced, 14 x 14 in. and larger	60%	60%
Base board registers	40%	40%
Base board intakes	40%	40%
White enameled goods	15%	15%
Solid brass or bronze goods, except grilles	net	net
Grilles in black and white japan or electroplate in cast iron, plain lattice design—smaller than 14 x 14 in.	40%	40%
—Less than 14 x 14 in.	60%	60%

REINFORCING BARS

High carbon steel from mill	$48.50	$49.50
Medium steel from mill	48.50	49.50

ROOFING MATERIAL

Tarred Paper:		
1-Ply, per ton	$62.00	$65.00
2-Ply	1.05	1.00
3-Ply	1.40	1.40
Rosin sized sheathing, per ton	60.00	60.00

Corrugated roofing, galvanized, 2½ in. corrugation, over flat sheets, 30c. per 100 lbs.

ROSIN

Common to good, strained (wholesale), 80 lb., per gal.	$16.50*	....

SAND

Mason, per cu. yd	$1.80	$2.25
Torpedo, per cu. yd	1.80	2.25

SHINGLES

Red cedar, 5 to 2, clear, per thousand	$10.75	$7.00
White cedar, extra star, A star, per thousand	10.00	6.50

SLATE ROOFING

	F.O.B. cars, Quarry Station	F.O.B. Chicago
Pennsylvania:		
Best Bangor	$6.50 to $9.00	$10.20 to $11.45
No. 1 Bangor Ribbon	6.75 to 7.25	9.20 to 9.70
Pen Argyl	7.25 to 9.00	9.70 to 10.45
Peach Bottom	10.00 to 12.50	12.45 to 14.45
No. 1 Chapman	7.25 to 8.25	8.70 to 9.95
Vermont:		
No. 1 Sea Green	3.50 to 6.75	5.95 to 9.00
Unfading Green	5.50 to 9.00	8.30 to 11.05
Red	13.00 to 16.00	14.80 to 22.80
Maine:		
Brownsville, U'f'g Black, No. 1	10.00 to 12.50	14.10 to 15.10
Slaters felt, 30 lb. roll	.92	.....
Slaters felt, 40 lb. roll	1.22	.....

SPIRITS TURPENTINE

	New York	Chicago
Per bbl.	$1.20*	$1.10

STONE SCREENINGS

Lime, per cu. yd	$2.35	$2.35

STRUCTURAL STEEL

Beams and channel, 3 to 15 in., per lb	2.72c.	3.47c.
Beams and channel, over 15 in., per lb	2.72c.	3.57c.
Angles, 3 to 6 in.	2.72c.‡	3.47c.
Zees and tees	2.72c.	3.47c.
Steel bars, half extras, from mill	2.35c.	3.37c

STUCCO

In cloth, per ton (white, mixed)	....	$21.50

STUCCO BOARD

Medium weight stucco board, plain, per M sq. ft.	$42.50	$45.00
Medium weight stucco board, creosoted, per M sq. ft.	50.00	50.00
Heavy weight stucco board, plain, per M sq. ft.	55.00	55.00
Heavy weight stucco board, creosoted, per M sq. ft.	60.00	60.00
Medium weight stucco board, plain, narrow key, per M sq. ft.	50.00	50.00
Medium weight stucco board, narrow key, creosoted, per M sq. ft.	55.00	55.00
Insulating board, heavy felt background, per M sq. ft.	50.00	50.00

SHEATHING BOARD

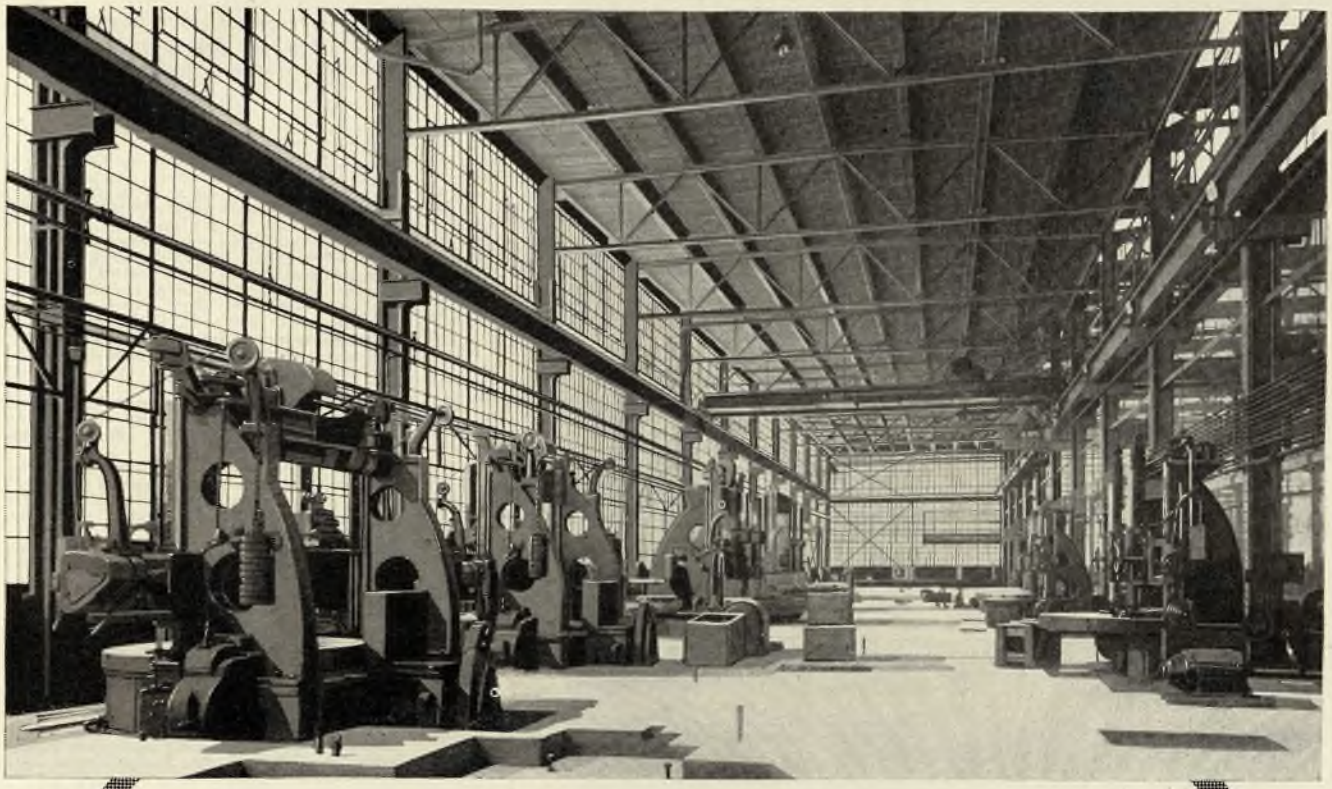
Heavy weight sheathing board, per M sq. ft.	$50.00	$50.00
Medium weight sheathing board, per M sq. ft.	45.00	45.00

Stucco or plaster board, sheathing board and insulating board are in rolls containing one sheet 25 ft. long and 4 ft. wide (100 sq. ft.)

WALL BOARD

Wall board, shipped any length, 4 ft. wide, per M.	$45.00	$45.00

Packed flat in cars if ordered in less than car lots. Add $5.00 per M ft. for crating.



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BUILDING NEWS

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Persons in charge of proposed work are requested to send us information concerning it as early as possible; also corrections of any errors discovered.

CALIFORNIA

LODI, CAL.—The Lodi Christian Church will erect a church. $40,000.

MARYSVILLE, CAL.—C. W. Burrell, Architect, First Trust Building, Oakland, soon receives bids for building four story, 119 x 160 ft., reinforced-concrete and brick, hotel, for Coyt Investment Co., 306 Fourteenth Street, Oakland. $250,000.

NAPA, CAL.—R. B. Blumenfeld of Empire theater has purchased Brown Hotel property and will erect a playhouse. $40,000.

OAKLAND, CAL.—Kahn's Department Store plans to build addition to store, on Sixteenth Street and Broadway. $600,000.

PASADENA, CAL.—Board of Education, Chamber of Commerce Building, is having plans prepared by J. C. Austin, Architect, 1125 Baker-Detwiler Building, Los Angeles, for group of buildings for athletic field at high school, to include 100 x 160 ft. gymnasium, locker and dressing rooms, etc.

POMONA, CAL.—Trustees of Pacific Colony, 2019 West Washington Street, Los Angeles, is having plans prepared by W. F. McClure, State Architect, Forum Building, Sacramento, for building institution for feebleminded, on Valley Boulevard. $100,000.

SACRAMENTO, CAL.—Will C. Wood, State Superintendent of Public Instruction, states that millions of dollars are to be appropriated for the prompt erection of school buildings in California.

SACRAMENTO, CAL.—Fort Sutter Bank plans to build bank, on Seventh and K Streets Weeks & Day, Phelan Building, San Francisco, Architects. $1,000,000.

SAN FRANCISCO, CAL.—A free public market is reported in contemplation by McCreery Estate Co., 221 Sansom Street. It will go up at Market and Eighth Streets. $300,000.

CONNECTICUT

EAST HARTFORD, CONN. (Hartford P. O.)—Town plans to complete unfinished rooms in new high school, on Chapman Street. P. S. Bryant, 847 Main Street, Hartford, Commissioner. $50,000.

GLASTONBURY, CONN.—Town plans to build two one story brick schools. W. H. McLean, 110 Tremont Street, Boston, Architect. $55,000.

GROTON, CONN.—Town is having plans prepared for building one story, 65 x 100 ft., concrete, steel and brick, school. Bilderbeck & Langdon, Inc., Barrows Building, New London, Architects. $50,000.

HARTFORD, CONN.—South School District is having preliminary plans prepared by Whiton & McMahon, Architects, 36 Pearl Street, for building two story brick addition to school on Wethersfield Avenue. R. S. Winsella, Chairman.

HARTFORD, CONN.—The Hartford Rubber Company will triple the size of its plant by the addition of several buildings, increasing its yearly payroll from $2,500,000 to more than $7,500,000. Charles B. Whittlesey, President.

HARTFORD, CONN.—City is having plans prepared for building three story addition to A. E. Burr School, on Wethersfield Avenue, reinforced-concrete, steel and brick. Whiton & McMahon, 36 Pearl Street, Architects. $125,000.

MIDDLETOWN, CONN.—City is having plans prepared for building two story concrete, steel and brick addition to Johnson School, on Greene Street. Brown & Von Beren, 185 Church Street, New Haven, Architects. $75,000.

NEW BRITAIN, CONN.—Adkins Printing Co., 66 Church Street, plans to build addition to present printing plant. $50,000.

NEW BRITAIN, CONN.—City plans to build school in western section. $200 000.

NEW BRITAIN, CONN.—Hart & Hutchinson Co., Corbin Avenue propose building one story, 77 x 340 ft., brick and steel, factory addition. $70,000.

NEW HAVEN, CONN.—State Board of Health, Capitol, Hartford, plans to build laboratory, in Huntington Street, here. $100,000.

NEW HAVEN, CONN.—Brown & Von Beren, Architects, have plans for business building, 185 Church Street, four story, reinforced-concrete, on Chapel Street, for Besse, Ritchey & Co., 784 Chapel Street. $50,000.

NEW LONDON, CONN.—Ohev Sholum Congregation soon lets contract for building two story, 40 x 82 ft., brick synagogue, reinforced-concrete flooring and concrete foundation, on Blinman Street. Reuben Lubschansky, North Main Street, President. $50.000.

PLAINVILLE, CONN.—Burnbaum & Menus, 66 Arch Street, New Britain, is having plans prepared for building store. C. C. Palmer, 272 Main Street, New Britain, Architect. $50,000.

PUTNAM, CONN.—Mannasset Mfg. Co. contemplates building two story, 100 x 200 ft., brick and mill construction mill. $125,000.

SOUTH MANCHESTER, CONN.—Manchester Trust Co., 1907 Main Street, plans to build brick and stone bank. $60,000.

THOMPSONVILLE, CONN.—Town of Enfield plans to build new fireproof high school. Address H. R. Cooper, Thompsonville. $150,000.

WAREHOUSE POINT, CONN. — Hartford County Home, Hartford, is having plans prepared for building new school, hospital, heating plant and dormitory. M. J. Unkelbach, 162 Main Street, New Britain, Architect. $200 000.

WATERBURY, CONN.—Scoville Mfg. Co., 99 Mill Street, plans to build office building and garage, on Cole, Baldwin and Mill Streets. $125,000.

WATERBURY, CONN.—St. Margaret's School, Rose Hill, is having plans prepared for building three story school, reinforced-concrete, steel and brick addition, on Grove and Cook Streets. Murphy & Dana, 311 Madison Avenue, New York City, Architects. $100,000.

WEST HARTFORD, CONN.—Town is having plans prepared by W. T. Marchant, Architect, 86 Pearl Street, Hartford, for building two story, 100 x 100 ft., brick, steel and concrete, high school, on South Main Street. $100,000.

WILLIMANTIC, CONN.—Knights of Columbus, 751 Main Street, plan to build two story clubhouse, on Pleasant Street. $50,000.

FLORIDA

FOUNTAIN, FLA.—St. Andrew Bay Lumber Co., Millville, plans to establish plant here. $150,000.

MILLVILLE, FLA.—St. Andrew Bay Lumber Co. plans to improve plant. $40,000.

ILLINOIS

MOLINE, ILL.—Whitsitt & Schulzke, Architects, 610 Peoples' Bank Building, will design one story, 40 x 100 ft., reinforced-concrete and cut stone, bank, on Fifth Avenue and Sixteenth Street, for Fifth Avenue Trust & Savings Bank. $70,000.

MOLINE, ILL.—Whitsiee & Schelzke, Architects, 610 Peoples' Bank Building, will prepare plans for one story, 100 x 128 ft., brick, school, on Sixteenth Avenue and Twenty-fifth Street, for Board of Education. $80 000.

ROCK ISLAND, ILL.—Cervin & Horn, Architects, 310 Safety Building, will build 90 x 150 ft., reinforced-concrete, theater, on Nineteenth Street and Third Avenue, for Rosenfield-Hopp Co. $250,000.

INDIANA

GARY, IND.—Gary Methodist Episcopal Hospital, care Schmidt, Garden & Martin, Architects, 104 South Michigan Avenue, Chicago, is receiving bids for building five story, 110 x 130 ft., brick and reinforced-concrete, hospital. $400,000.

OAKLANDON, IND.—Commissioners of Marion County will build tuberculosis hospital here.

PRINCETON, IND.—A colosseum will be erected in memory of the soldiers of all wars, as per report of Gibson County Commissioner. $150,000.

IOWA

BELLE PLAINE, IOWA.—Methodist Congregation is having plans prepared by Liebbe, Nourse & Rasmussen, Architects, 524 Utica Building, Des Moines, for two story church. $50,000.

CLINTON, IOWA.—Our Lady of Angels Academy plans to build addition. $200,000.

CLINTON, IOWA.—Jane Lamb Memorial Hospital is having plans prepared by Schmidt, Garden & Martin, Architects, 104 South Michigan Avenue, Chicago, for four story, 38 x 133 ft., brick and reinforced-concrete, addition. $200.000.

SIOUX CITY, IOWA.—Hawkeye Mfg. Co., 2700 Floyd River Road, plans to build 75 x 145 ft. addition to factory. $30.000.

STORM LAKE, IOWA.—Buena Vista College plans to build gymnasium. W. C. Edson, Chairman, Board of Directors. $50 000.

WHITING, IOWA.—Board of Education voted $150,000 bonds to build school.

KANSAS

FORT DODGE, KAN.—State is having plans prepared by R. L. Gamble, Architect, Topeka, for two story, 40 x 51 ft., reinforced-concrete, steel and brick, Soldiers' Home, with two wings, 35 ft. long. $75,000.

HUTCHINSON, KAN.—E. Colson is having plans prepared by W. E. Hulse & Co., Architects, Hutchinson, for six story, 60 x 150 ft., reinforced-concrete, steel and brick hotel. $100,000.

HUTCHINSON, KAN.—R. E. Johnson is having plans prepared by W. E. Hulse & Co., Architects, Hutchinson, for one story, reinforced-concrete, steel and brick, theater. $100,000.

INDEPENDENCE, KAN.—Commercial National Bank will erect a seven story structure on Pennsylvania Avenue and West Myrtle Street.

OSAGE CITY, KAN.—First Presbyterian Congregation is having plans prepared by W. E. Hulse & Co., Architects, Hutchinson, for two story, reinforced-concrete, steel and brick, church. $50,000.

PLEASANTON, KAN.—Board of Education will build two story, 72 x 84 ft., concrete, steel and brick, school. H. R. Primmer, Nevada, Mo., Architect. $53,000.

KENTUCKY

LOUISVILLE, KY.—Southern Baptist Theological Seminary, 729 South Fifth Street, acquired site on Brownsboro Road, near Reservoir Park, and plans to build seminary, to include lecture hall, president's office, chapel, library, administration building, two dormitories, gymnasium, commons and power house, etc. Project also includes driveways, recreation fields, etc.

LOUISIANA

NEW ORLEANS, LA.—Charity Hospital Tulane Avenue, is having plans prepared by A. W. Lewin, Engineer, care Association Commerce, 635 Common Street, for two story, concrete, steel and brick, power house, on Tulane Avenue. $90,000.

MARYLAND

BALTIMORE, MD.—Luther Memorial Lutheran Congregation plans to build one and two story, 75 x 150 ft., stone and brick, church, on Guilford Terrace and University Parkway. L. L. Sieber, 345 Ilchester Avenue, Pastor. J. Freund, 11 East Lexington Street, Architect. $100,000.

BALTIMORE, MD.—St. Mary's Industrial School, Wilkins Avenue, plans to build four story, 63 x 131 ft., reinforced-concrete and brick dormitory and 30 x 75 ft. concrete swimming pool. H. I. Kavanaugh, 913 North Charles Street, Architect. $200,000.

BALTIMORE, MD.—Johns Hopkins University Alumni Association is raising $300,000 fund to build memorial dormitory on university grounds at Homewood. G. L. Radcliffe, Fidelity Building, Chairman. Executive Committee.

HIGHLANDTOWN, MD. (Baltimore P. O.)—Jones & Lamb Co., Pennsylvania and Fulton Avenues, soon lets contract for remodeling plant of Monumental Brewery Co. and constructing several reinforced-concrete, steel and brick buildings, on Lombard Street. $500,000.

MASSACHUSETTS

BELMONT, MASS.—August Johnson Co., Davis Square, Somerville, Mass., is to construct eight residences on Cedar Road, Belmont, Mass., from designs of Walter T. Littlefield, Architect, 9 Hamilton Place, Boston, Mass. $10.000 each.

BOSTON, MASS.—E. J. Doherty, North Margin Street, is having plans drawn for one story garage of brick and concrete, 90 x 230 ft., to be constructed on Main Street, Charlestown District, Boston, Mass., corner of Stacey Street. Architect, Walter T. Littlefield, 9 Hamilton Place, Boston, Mass. $50,000.

BOSTON, MASS.—Old South Trust Co., Boston, Mass., is constructing new bank quarters in Old South Building, Boston, Mass. Architect, Walter T. Littlefield, 9 Hamilton Place, Boston, Mass. $30,000.

FALL RIVER, MASS.—L. E. Danforth, 76 Dorrance Street, Providence, R. I., soon receives bids for one story, 100 x 156 ft., garage, reinforced-concrete, steel and brick, on Main Street. $70,000.

GREENFIELD, MASS.—G. W. Wilcox, Federal Street, plans to build three story business building. $50,000.

LEXINGTON, MASS. — Town appropriated $75,000 to build school on Bedford Street. Address J. W. Swan, Clerk.

NEEDHAM, MASS.—Needham Tire Co. is constructing new tire factory at Needham, Mass., from plans of Walter T. Littlefield, 9 Hamilton Place, Boston, Mass. Size 60 x 100 ft. $60,000.

SOMERVILLE, MASS.—Somerville Hospital Corporation is having plans prepared for additions to hospital in Somerville, Mass., by Walter T. Littlefield, 9 Hamilton Place, Boston, Mass. $30,000.

SPRINGFIELD, MASS.—Wason Mfg. Co., Brightwood, plans to build two story, brick and concrete, addition to factory, here. $100,000.

WORCESTER, MASS. — Worcester Housing Corporation soon receives bids for building sixty two story, brick, workmen's houses, on four sites. J. D. Leland, 7 Water Street, Boston, Architect. $250,000.

MICHIGAN

CADILLAC, MICH.—First Methodist Congregation is having plans prepared by W. E. N. Hunter, Architect, 1306 Chamber of Commerce, Detroit, for one story, 80 x 80 ft., brick, church. $50 000.

DETROIT, MICH.—P. J. Rosello, Architect, 406 Congress Building, has perfected plans for building two story, 60 x 118 ft., brick and steel, clubhouse, on Farnsworth and Russell Streets, for Deftaptape Romane Society, care architect. $65,000.

DETROIT, MICH.—L. Kamper, Associated Architect, 752 Book Building, is receiving bids for one story, 112 x 220 ft., church, three story, 56 x 58 ft. rectory and 36 x 38 ft. garage, concrete, brick and steel, for St. Hyacinth Congregation. McDougall and Frederick Avenues. S. I. Kilkiewicz, 888 Frederick Avenue, Pastor. E. Brielmaier & Sons, 432 Broadway, Milwaukee, Wis., Architects. $250,000.

DETROIT, MICH.—J. McNamara, President, Public Welfare Commission, City Service Building, will build four story, 50 x 87 x 216 ft., reinforced-concrete, brick and steel, hospital, on St. Antoine and Macomb Streets. J. Scott & Co., 2326 Dime Bank Building, Architects. $420,000.

FLINT, MICH.—Genesee Co. soon lets contract for building two story, reinforced-concrete, brick and steel, juvenile detention home. G. H. Swift, 105 Armory Building, Architect. $160,000.

HIGHLAND PARK, MICH. (Detroit P. O.)—Board of Education, Gerald Avenue, is having plans prepared by W. H. Adams and Butterfield & Butterfield, Architects and Engineers, Vinton Building, Detroit, for two story reinforced-concrete and brick addition to Willard School, on Hamilton Boulevard and Waverly Avenue. $300,000.

JACKSON, MICH.—Jackson County soon receives bids for building four story, 46 x 145 ft., reinforced-concrete, brick and steel, hospital. E. F. Stevens, care H. B. Neagle, Architect. $90,000.

ST. CLAIR, MICH.—Board of Education is having plans prepared by Perkins, Fellows & Hamilton, Architects, 814 Tower Court, Chicago, for two story, brick and timber, school. $150,000.

MINNESOTA

AURORA, MINN.—School District No. 13 will build three story, reinforced-concrete, brick and steel, high school. Tyrie & Chapman, 320 Auditorium Building, Minneapolis, Architects. $150,000.

BEMIDJI, MINN.—M. Kaplan is receiving bids for three story, 50 x 140 ft., store, hotel and apartment building. $50,000.

MINNEAPOLIS, MINN. — Federal Reserve Bank, New York Life Building, purchased site on Marquette Avenue and Fifth Street and plans to build bank. $1,500,000.

MINNEAPOLIS, MINN.—Chamber of Commerce, Fourth Avenue and Third Street, is having plans prepared by Bertrand & Chamberlain, Architects and Engineers, 616 North West Bank Building, for twelve story office, 130 x 195 ft., reinforced-concrete. $810,000.

MINNEAPOLIS, MINN. — Farwell, Ozmun, Kirk & Co., Fairfield Avenue and Water Street, is having preliminary plans prepared for six story, 110 x 300 ft., reinforced-concrete and brick, addition to storage and distributing plant. $200,000.

MORRIS, MINN.—State Board of Control, Capitol, St. Paul, will build two story, 45 x 120 ft., boys' dormitory, at State Farm, here. C. L. Pillsbury Co., Metropolitan Life Building, Minneapolis, Engineers. C. H. Johnson, 715 Capital Bank Building St. Paul, Architect. $75,000.

NASHWAUK, MINN.—Board of Education is having revised plans prepared by Tyrie & Chapman, Architects, 320 Auditorium Building, Minneapolis, for grade and high school here. $300,000.

ST. PAUL, MINN.—C. Weinhagen & Co., 480 Jackson Street, plans to build four story, 110 x 230 ft., reinforced-concrete and brick, factory and office, on Fourteenth Street, near Pine Street. C. Weinhagen, President. $200,000.

ST. PAUL, MINN.—C. A. Hausler, City Engineer, is receiving bids for two story, 34 x 82 ft., reinforced-concrete, addition to Galtier School, on Charles Street and Hamilton Avenue. $50,000.

WINONA, MINN.—State Board of Control, St. Paul, will build three story, 46 x 130 ft., reinforced-concrete and brick, dormitory here for women. C. H. Johnston, 715 Capital Bank Building, St. Paul, Architect and Engineer. $100,000.

MISSOURI

MEXICO, MO.—Hardin College plans to construct five one to three story buildings, on campus, to include dormitory, academic building, hospital, observatory and heating plant. J. W. Million, President. $260,000.

ST. JOSEPH, MO.—Roberts Cone Co., 709 North Third Street, plans to build five story, 100 x 140 ft., reinforced-concrete, steel and brick, factory, on Third Street. $200,000.

ST. LOUIS, MO.—Laclede Investment Co., 5323 Ridge Avenue, plans to build seven story, 150 x 207 ft., fur storage building, on Fourth and Market Streets. N. R. Darragh, President. $100,000.

ST. LOUIS, MO.—Masonic Temple Association, Grand Street and Finney Avenue, is having plans prepared by W. B. Ittner, Architect, Board of Education Building, for 302 x 325 ft., temple, on Grand and Lindell Streets. K. Vetsburg, Chairman, Building Commission. $1,000,000.

ST. LOUIS, MO.—Scottish Rite Cathedral Association, 7 Westmoreland Place, is having plans prepared by W. B. Ittner, Architect, Board of Education Building, for 150 x 200 ft., cathedral, on Lindell Street, near Grand Avenue. A. G. Cochran, President. $1,000,000.

UNIVERSITY CITY, MO. (St. Louis P. O.)—Board of Education plans to build two grade schools and addition to high school. L. T. Ward, 8 Princeton Place, President. $220,000.

PORTLAND, MO.—Vick Bros., 264 North High Street, plans to build two story, 100 x 100 ft., concrete and brick, warehouse, on East Third Street. $50,000.

MONTANA

FORSYTH, MONT.—Rosebud County will have vote on $70,000 bonds to build hospital. McIver, Cohagen & Marshall, 407 Electric Building, Billings, Architect.

SIDNEY, MONT.—Richland County will vote on $50,000 bonds to build courthouse. L. Linker, Clerk.

WOLF POINT, MONT.—H. A. Frenz, Architect, is preparing plans for a theater for Cristad & Severson, owners, of the Glacier Theater. $30,000.

NEBRASKA

OMAHA, NEB.—M. F. Shafer, President, American Bank Building Co., Eighteenth and Farnam Streets, is having preliminary plans prepared by J. & A. McDonald, Architects, 908-12 Omaha National Bank Building, for twenty story, 90 x 133 ft., steel and brick, bank, stores and offices, on Nineteenth and Farnam Streets. $1,250,000.

OMAHA, NEB.—H. A. Salisbury and T. R. Kimball, Architects, 836 World-Herald Building, are preparing plans for one story, 60 x 120 ft., brick and stone, church, on Forty-first and Farnum Streets, for McCabe Methodist Church. $60,000.

OMAHA, NEB.—Sinclair Refining Co., 111 West Washington Street, Chicago, Ill., is having plans prepared by company's engineers for building 102 x 132 ft. garage, two story, 100 x 160 ft., reinforced-concrete, warehouse, machine shop cooperage and barreling plant, on Eleventh and Seward Streets; also series of service stations at various locations throughout city. W. T. Dinkins, 901-5 Woodmen of World Building, Local Manager. $250,000.

OMAHA, NEB.—John McDonald has prepared plans for the erection of a building which the American State Bank will build at 192 Farnam Street. $2,000,000.

NEW JERSEY

JERSEY CITY, N. J.—American Grocers' Association, 183 Morgan Street, plans to build five story, 100 x 100 ft., reinforced-concrete, warehouse, on West Side Avenue. F. Grad, 245 Springfield Avenue, Newark, Architect. $150,000.

PHILLIPSBURG, N. J.—Warren County Memorial Association plans to build hospital. Address D. Swern, care Berlin-Swern & Randall. $185,000.

TRENTON, N. J.—St. Paul's Episcopal Congregation, care Sutphin, 3-7 Spring Street, is having plans prepared by G. E. Savage, Architect, Witherspoon Building, Philadelphia, for one to three story church, 52 x 115 ft., on Fishers Place. $60,000.

TRENTON, N. J.—Board of Education, 9 South Stockton Street, plans to build three story, brick and stone, addition to Jefferson School, on Brunswick Avenue. W. A. Poland, 1 Woodside Avenue, Architect. $190,000.

WESTFIELD, N. J.—Peoples Bank & Trust Co. plans to build bank on Elm Street. $50,000.

NEW YORK

BROOKLYN, N. Y.—Adelphi College, Clifton Street and St. James Place, is having preliminary plans prepared by McKim, Mead & White, Architects, 101 Park Avenue, New York City, for four story brick and steel college, on Washington Avenue. $800,000.

BUFFALO, N. Y.—Wm. J. Conners, proprietor of *Buffalo Courier* and *Buffalo Enquirer*, has permit to erect a thirty story building for newspaper purposes on 246 Main Street.

JOHNSON CITY, N. Y.—R. C. Pratt plans to build artificial ice plant, reinforced-concrete and brick. $175,000.

NEW YORK, N. Y.—Ballinger & Perrott, Architects and Engineers, 47 West Thirty-fourth Street, are preparing plans for building nine story brick, steel and reinforced-concrete addition, on Spring and Varick Streets, for Butterick Publishing Co. $1,200,000.

NEW YORK, N. Y.—A hotel will be erected by D. M. Linnard Co., on a site at Park Avenue and Fifty-first Street. $7,000,000.

NEW YORK, N. Y.—J. S. Hannon, 445 West Sixteenth Street, will erect two story, 72 x 75 ft., brick and steel, garage, at 433-437 West Sixteenth Street. J. S. Maher, 431 West Fourteenth Street, Architect and Engineer. $50,000.

NEW YORK, N. Y.—The Stratford Hotel will be erected at Seventy-fourth Street and West End Avenue from plans by Schwartz & Gross; fourteen stories. $1,700,000.

NEW YORK, N. Y.—Krim Realty Co., 426 West Fourteenth Street, is having plans prepared by M. Schwartz, Architect, 309 Broadway, for three story, 25 x 166 ft., brick and steel store and office, at 143 West Thirty-third Street. M. Krim, President. $100,000.

NEW YORK, N. Y.—St. Regis Lunch Co., care A. Levingson, Architect and Engineer, 405 Lexington Avenue, is having plans prepared for three story, 60 x 100 ft., brick, steel and stone store and loft, at 42-46 West Thirty-third Street. $80,000.

ROCHESTER, N. Y.—Rosenberg Bros. & Co., 436 Portland Street, plan to build four story, 55 x 299 ft., addition to clothing factory, at Fashion Park. $200,000.

ROCHESTER, N. Y.—Sargent & Greenleaf Co., Court Street, plans to build brick factory covering 50,000 sq. ft. floor space. Address W. H. Foxall, Vice-President. $175,000.

SCHENECTADY, N. Y.—M. Spiegel, Strand Theater Building, New York City, soon lets contract for altering exterior and interior of two story, brick, steel and stone, theater, here. De Rosa & Pereira, 110 West Fortieth Street, New York City, Architects. $100,000.

TROY, N. Y.—An armory will be erected in Troy, N. Y., from plans prepared by State Architect Lewis F. Pilcher, Albany, N. Y. $475,000.

TROY, N. Y.—State Armory Commission, Telephone Building, Albany, had plans prepared for brick armory, to consist of two story, 50 x 180 ft., administration building and 192 x 206 ft. drill shed. L. F. Pilcher, Capitol, Albany, State Architect. $475,000.

NORTH CAROLINA

CHARLOTTE, N. C.—Scottish Rite Cathedral Association, Inc., has acquired property at East Avenue and Division St., where a cathedral will be erected. $300,000.

WILSON, N. C.—Benton & Benton, Architects, Wilson, will build three story, 115 x 130 ft., brick business building, on Barnes and Lodge Streets, for B. Harrell Co., Wilson. $50,000.

NORTH DAKOTA

BISMARCK, N. D.—Knights of Columbus is having plans prepared for building five story, brick, club. $150 000.

FARGO, N. D.—Oak Grove Seminary plans to build seminary. T. T. Fjelstad, Cooperstown, Secretary. $65,000.

OHIO

AKRON, OHIO.—Board of Education will build three story, 100 x 200 ft., reinforced-concrete, steel and brick, school, on Diagonal Road. T. R. Ridley, Cottage Place, Architect. $260,000.

AKRON, OHIO.—Goodrich Rubber Co. is razing small buildings and will replace with eight story reinforced-concrete structure, 170 x 300 ft.

AKRON, OHIO.—Swirsky & Miller, Architects, Peoples Trust & Savings Building, will build three story, 50 x 110 ft., brick and steel factory and warehouse, for Akron Mattress Co., Railroad and Miami Streets. $80,000.

CANTON, OHIO.—C. E. Firestone, Canton, Architect, has prepared plans for a hotel, seven stories, on Market Avenue and Sixth Street, for the Canton Pythian Castle Co. $325,000.

Residence of C. Holsclaw—roofed with Carey Asfaltslate Shingles

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"A Roof For Every Building"

DO NOT limit your thought of Carey Roofing to any one or two kinds or types of roofing. Carey makes as many different kinds of roofing as are necessary to meet the most exact and particular requirements of every type of building.

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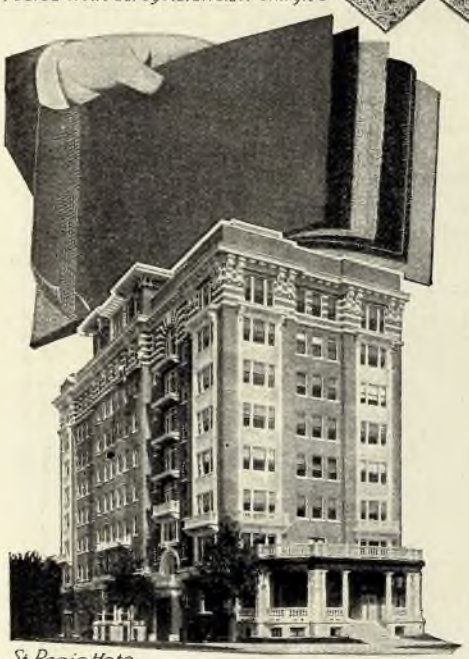

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Y.M.C.A. at Cincinnati roofed with Carey Built-Up Roofing—

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Boston	Dallas	Little Rock	New Orleans	San Antonio	Toledo
Buffalo	Denver	Los Angeles	New York	San Francisco	Toronto
Charlotte	Detroit	Louisville	Oklahoma City	Seattle	Wheeling
Chattanooga	Havana	Memphis	Omaha	Spokane	Washington, D. C.
Houston		Minneapolis		Philadelphia	

CANTON, OHIO.—A. H. Abrams of the Odean Theater will erect a three story, brick and steel, business block on Walnut Avenue and Second Street. $85,000.

CANTON, OHIO.—Board of Education plans to build two story, 114 x 200 ft., concrete, steel and brick, school, on Sixteenth and Vine Streets. $200,000.

CINCINNATI, OHIO.—Jewish Hospital plans to build maternity hospital, on Burnet Avenue. $150,000.

CLEVELAND, OHIO.—Paul Bros., Citizens Building, plan to build three story, 54 x 189 ft., concrete, steel and brick, addition, at 1938 Euclid Avenue. $60,000.

CLEVELAND, OHIO.—Cleveland Metal Products Co., 1111 Ivanhoe Road, is having plans prepared by G. S. Rider for one story, 60 x 200 ft., concrete, steel and brick, addition. $50,000.

CLEVELAND, OHIO.—Adison Square Investment Co., Addison Road and Wade Park Avenue, plans to build three story, 100 x 200 ft., reinforced-concrete, steel and brick, theater. $100,000.

CLEVELAND, OHIO.—Arjo Realty Co., 214 Williamson Building, is having plans prepared by Lehman & Schmidt, Architects, 210 Electric Building, for two story, 80 x 109 and 100 x 405 ft., concrete, steel and brick, addition to factory, at 6545 Euclid Avenue. $250,000.

CLEVELAND, OHIO.—Cleveland Metal Products Co., 1141 Ivanhoe Road, is having plans prepared by G. S. Rider Co., Architects, 612 Century Building, for one story, 120 x 300 ft., addition to foundry; $75,000. Also, three story, 72 x 266 ft., addition to machine shop, $75,000. Both concrete, steel and brick.

CLEVELAND, OHIO.—A. C. Bishop, Architect, 427 Guardian Building, is receiving bids for building five story, 118 x 120 ft., concrete, steel and brick, factory, on West Forty-sixth Street and Train Avenue, for Ko-Ko-Mar Co., Leader-News Building. $50,000.

CLEVELAND, OHIO.—Wm. Dunbar & Co., Cedar Avenue, Cleveland, has contract for printing factory, 1741 E. Twenty-fourth Street, owner Corday & Bross, Vulcan Building, two story, reinforced-concrete and steel, 144 x 200. $250,000.

CLEVELAND, OHIO.—Mill work plant will go up at Lorain Avenue and West Twentieth Street, owner A. Teachout Co., 321 West Prospect. Entire new plant to replace present one. $700,000.

CLEVELAND, OHIO.—Cleveland Illuminating Co., Illuminating Building, proposes building one story, 70 x 167 ft., concrete, steel and brick, garage, at 6500 Cedar Avenue. P. H. Cobb, Illuminating Building, Architect. $60,000.

CLEVELAND, OHIO.—Cleveland Metal Products Co., 1141 Ivanhoe Road, is having plans prepared by G. S. Rider, Architect, 612 Century Building, for one story, 29 x 54 x 12 ft., storage building, cost $60,000, and three story, 60 x 90 ft., addition to assembling room, concrete, steel and brick. $120,000.

DAYTON, OHIO.—S. Frank and C. Weisman, Sixth and Ludlow Streets, plan to build three or four story, 80 x 130 ft., reinforced-concrete and brick, business building, on South Ludlow Street. $100,000.

DAYTON, OHIO.—Westminster Presbyterian Congregation, Third and Ludlow Streets, plans to build church. $300,000.

TOLEDO, OHIO.—De Vore & McGorman are preparing plans for a four story building to be constructed for the Knights of Columbus. $465,000.

TOLEDO, OHIO.—Frank O'Neill, President, O'Neill Machine Co., has purchased ground at W. Bancroft and Auburn Streets, where he will build a factory. $100,000.

WEST PARK, OHIO.—Board of Education is having plans prepared by P. T. Cahill, Architect, 631 Hippodrome Building, Cleveland, for two story, 26 x 48 ft., on Settlement Road, $50,000; two story, 36 x 80 ft., on Longwood Avenue, $50,000; all two story, 90 x 90 ft., high school, on Riverside Avenue, all concrete, steel and brick.

OREGON

HEPPNER, ORE.—B. P. O. E. of Heppner plans to build two story, brick, lodge hall. J. V. Bennes, Chamber of Commerce Building, Portland, Architect.

PORTLAND, ORE.—E. H. Cahalin, Eleventh and Stark Streets, is having plans prepared by F. M. White, Architect, Chamber of Commerce Building, for one story, 100 x 115 ft., tile and brick, garage.

PENNSYLVANIA

ALTOONA, PA.—A hotel is proposed by the Chamber of Commerce. F. Woods Backman, President. $800 000.

BLAIRSVILLE, PA.—Western State Hospital for Insane, Altoona, is having plans prepared by F. McC. Crooks, Architect, 530 Fourth Avenue, Pittsburgh, for hospital and group institutional buildings.

DARBY, PA.—Darby Terminal Railroad is having sketches drawn by W. W. Potter, Architect, Real Estate Trust Building, Philadelphia, for building three story, 25 x 85 ft., brick station. $50,000.

EDDYSTONE, PA.—A. Reid, Secretary, Board of Education, soon lets contract for building two story, 70 x 80 ft., concrete and brick school. Ritter & Shay, North American Building, Architects. $70,000.

HARRISBURG, PA.—Grace M. E. Congregation is having plans prepared for altering brick, steel and stone church. W. S. Stoddard, 9 East Fortieth Street, New York City, Architect. $55,000.

JOHNSTOWN, PA.—Johnstown Lodge No. 48, Loyal Order of Moose, purchased 50 x 175 ft. site, on Bedford Street and plans to build four story, brick and stone lodge. C. A. McKeown, Trustee.

NORRISTOWN, PA.—Pennsylvania Trust Co. soon receives bids for altering interior of four story building. Simon & Simon, 249 South Juniper Street, Philadelphia, Architects. $50,000.

PHILADELPHIA, PA.—St. George's Congregation, Venango and Richmond Streets, is having plans prepared by Fieldstein & Schaef, Architects, 1328 Chestnut Street, for building three story, 52 x 92 ft., brick and stone, church. $50,000.

PHILADELPHIA, PA.—Methodist Episcopal Hospital, Broad and Ritner Streets, is having plans prepared by H. W. Castor, Architect, 21 South Twelfth Street, for five story, 80 x 135 ft., private ward building, brick or stone. $50,000.

PHILADELPHIA, PA.—Union National Bank, Third and Arch Streets, is having plans prepared for building three story, 60 x 75 ft., concrete and stone, bank. J. T. Brugger, 505 Chestnut Street, Architect. $100,000.

POTTSTOWN, PA.—High School Alumni Association is having plans prepared for building two story, 48 x 120 ft., concrete and brick, hall and library on High Street, near Madison Street. Hewitt & Ash, 520 Walnut Street, Philadelphia, Architects. $100 000.

READING, PA.—Carr & Schad is having plans prepared by W. H. Lee, Architect, 32 South Seventeenth Street, Philadelphia, for one story, 113 x 200 ft., concrete, steel and brick, theater, on Ninth and Spring Streets, here. $80,000.

WILLIAMSPORT, PA.—E. L. Taylor, President, Board of Education, will build two two story, 150 x 200 ft., brick, steel and reinforced-concrete, schools, one on Wayne Avenue and Newberry Street and another on site of Curtin Building, north of Braden Park. E. E. Joralemon, 547 Franklin Street, Buffalo, N. Y., Architect. $150,000.

RHODE ISLAND

CRANSTON, R. I. (Providence P. O.)—United Wire & Supply Co., Auburn, proposes building two story, 100 x 120 ft. and 50 x 250 ft., brick and mill construction, additions to factory. Perry & Whipple, 17 Exchange Street, Providence, Engineers. $125,000.

PROVIDENCE, R. I.—K. B. Ely, Boston Mass., will build auto sales building and service station, on Reservoir Street. W. R. Walker Son, 117 Custom House Street, Architects.

SOUTH CAROLINA

CHARLESTON, S. C.—Military College of South Carolina, Charleston, has acquired forty acre site at Hampton Park and plans to build citadel, first unit consisting of two three story buildings, to be used as barracks and classroom; other buildings to be erected later. Project involves grading, draining and landscape work. J. P. Thomas, Jr., Charleston, Chairman, Board of Visitors. Lockwood, Greene & Co., Healy Building, Atlanta, Ga., Architects and Engineers. $600,000.

COLUMBIA, S. C.—Coca Cola Bottling Co., 1111 Gervais Street, plans to build two story, 100 x 190 ft., bottling plant on block 1100 Main Street. $60 000.

GAFFNEY, S. C.—The erection of a cotton mill will be undertaken by E. R. Cash. Superintendent of Limestone Mills and Hamrick Mills, of which Dr. W. C. Hamrick is president. $300,000.

ROCKHILL, S. C.—C. L. Cobb, A. Long and associates, care Peoples National Bank, plan to build three or four story cotton mill. $500,000.

ROCK HILL, S. C.—Winthrop College Building Committee proposes constructing three story, 100 x 225 ft., students' building, on campus. D. B. Johnson, Chairman. Edwards, Sayward & Leitner, 600 Chamber of Commerce Building, Atlanta, Ga., Architects. $80,000.

YORK, S. C.—A cotton mill will be erected. Will be called Waltmore in honor of its president, Major Walter G. Moore, of the Hard Yarn Spinners' Association. $450,000.

SOUTH DAKOTA

ABERDEEN, S. D.—McCarthy Theater Co., Watertown, purchased site here and plans to build theater. $100,000.

BROOKINGS, S. D.—Board of Education plans to build two story, 152 x 176 ft., brick and reinforced-concrete, high school. Tyrie & Chapman, 320 Auditorium Building, Minneapolis, Minn., Architects. $200,000.

IPSWICH, S. D.—City voted $85,000 bonds to build chool. E. M. Paul, Clerk.

WINNER, S. D.—Tripp Co. plans election to vote on $150,000 bonds to build courthouse.

TENNESSEE

BLOUNTVILLE, TENN.—D. A. Barger, Chairman, Building Commission, proposes building reinforced-concrete and brick courthouse, here, for Sullivan County. T. S. Brown, Bristol Va., Architect. $50,000.

CHATTANOOGA, TENN.—C. W. and G. L. Rapp, Architects, 190 North State Street, Chicago, will build one story, 100 x 150 ft., reinforced-concrete and brick, theater, for Signal Amusement Co., 719 Market Street. $250,000.

TEXAS

DALLAS, TEX.—Southern Methodist University plans to build memorial hall. J. E. Cockrell, President, Board of Trustees. $400,000.

EASTLAND, TEX.—First National Bank plans to build five story, reinforced-concrete and brick, bank, on Lamore and West Streets. Lang & Witchell, Southwestern Life Building, Dallas, Architectus. $250,000.

FORT WORTH, TEX.—Mrs. F. B. Robinson contemplates erection of an apartment, on W. Fourth and Burnet Streets, Fort Worth. $100,000.

RANGER, TEX.—M. Gohlson plans to build five story, 85 x 140 ft., reinforced-concrete and brick, hotel. Beshgetoorian & Cobelli, Ranger, Architects. $200,000.

TEXARKANA, TEX.—The directors of the Texarkana Hotel Company have employed Mann & Stern, Architects, of Little Rock, Ark., to prepare plans and specifications for the new hotel. $500,000.

VIRGINIA

BEDFORD, VA.—St. John's Episcopal Congregation plans to build 40 x 100 ft. church and 60 x 110 ft. Sunday School and rectory; native stone, limestone trim. Craighill & Cardwell, 517 People's Bank Building Lynchburg, Architects.

ROANOKE, VA.—John F. Barbour has been awarded contract to erect a three story brick building for the Roanoke Lodge, 147, Knights of Pythias. $65,000.

WASHINGTON

HOQUIAM, WASH.—Commercial Club proposes erection of a hotel. $250,000.

SEATTLE, WASH.—A power building has been designed by City Architect David Huntington for Lake Union Steam Plant. $100,000.

SEATTLE, WASH. — Seattle Engineering School, 100 West Roy Street, plans to build three story, 165 x 246 ft., masonry gas engine building and garage, on Queen Anne Hill. Plans include workshop, gas engine department, boiler rooms, etc. S. D. Ford, Lyon Building Architect. $135,000.

SPOKANE, WASH.—The Spokane Drug Co. plans to build a five story, steel and concrete, wholesale plant, 116 x 142 ft., Wall Street and Northern Pacific Elevated track. A. L. Hawes, Vice-President. $200,000.

TACOMA, WASH.—Sutton & Whitney, National Realty Building, have prepared plans for twelve story office building for W. R. Rust. $750,000.

WALLA WALLA, WASH.—Erection of a hospital is planned by the official board of First Methodist Church. $250,000.

WEST VIRGINIA

CHARLESTON, W. VA.—Pugh Furniture Co., 908 Kanawha St., plans to build five story, 41 x 253 ft., brick, warehouse. H. R. Warren, Masonic Temple Building, Architect. $75,000.

PARKERSBURG, W. VA.—Parkersburg Rig Reel Co. soon receives bids for building one story, 105 x 220 ft., brick and steel foundry. Day & Zimmerman, 611 Chestnut Street, Philadelphia, Architects and Engineers. $75,000.

WISCONSIN

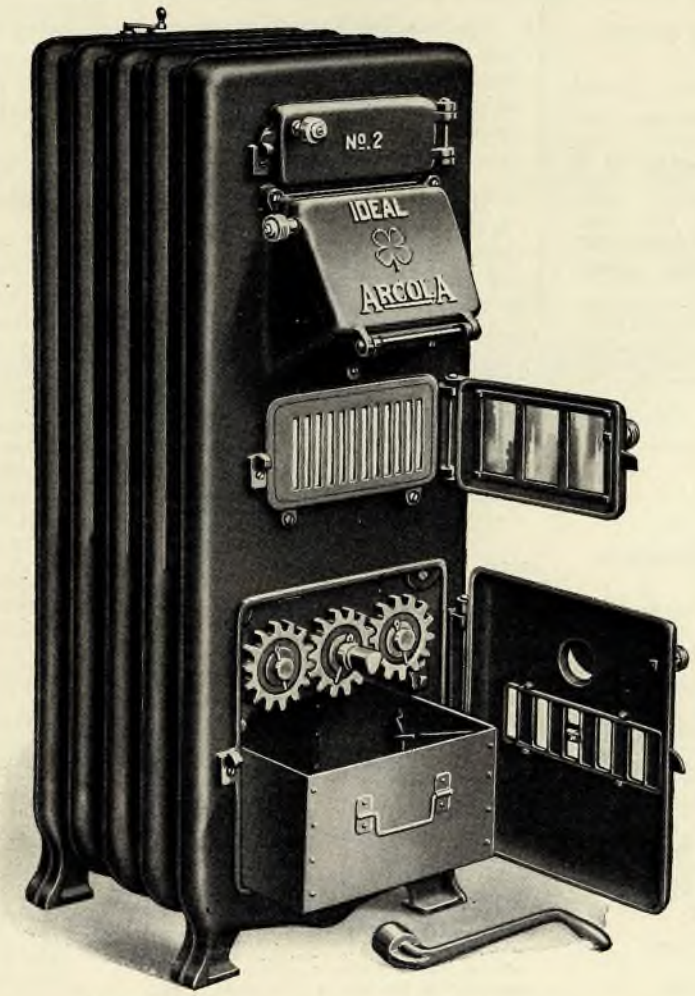
MANITOWOC, WIS.—Knights of Columbus, care P. A. Miller, Eighth and Commercial Streets, plan to build two story club, 100 x 110 ft., brick and tile, on Ninth and York Streets. $60,000.

THIENVILLE, WIS.—School Board, care L. Kieker, plans to build four story, 110 x 200 ft., reinforced-concrete and brick, school. Architect no selected. $70,000.

A war-invention

Hot Water Heat for small cellarless buildings and factory and community group houses

The IDEAL ARCOLA offers a quick, sure method of turning any old house into a cheery, modern *home*. The AMERICAN Radiators and their simple piping can be set in the rooms at convenience, and then when ready, the parlor stove is dismantled and the IDEAL ARCOLA Boiler is quickly set in its place and connected.



The IDEAL ARCOLA Radiator-Boiler provides Hot Water Heat for cellarless bungalows, small city and farm cottages, one story stores and office buildings, small country school-houses, country resort-cottages, small churches and chapels, garages, interurban street-car and railroad stations, weighing rooms, village fire houses, police stations, etc.

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Of Manufacturers' Data

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Dixon Crucible Co., Jos., Jersey City, N. J.

CASEMENT WINDOWS

METAL:
Pomeroy Co., Inc., S. H., 30 E. 42d St., N. Y.

CEMENT AND PLASTER

CEMENT:
Atlas Portland Cement Co., The, New York.

CORNER BEADS:
Concrete Engineering Co., Omaha National Bank Bldg., Omaha, Neb.
Milwaukee Corrugating Co., Milwaukee, Wis.

PLASTER:
National Kellastone Co., The, Chicago, Ill.

SPECIALTIES:
Bostwick Steel Lath Co., The, Niles, Ohio. Bostwick Corner Bead, Ground Bead, Cement Stops, Wall Plugs and Wall Ties.
Concrete Engineering Co., Omaha National Bank Bldg., Omaha, Neb.
Truscon Steel Co., Dept. 68, Youngstown, Ohio. Representatives in principal cities. Corner beads, "Kahn" curb bars, "Trus-Con" slotted inserts; "Kahn" adjustable inserts; "Trus-Con" National socket inserts; "Kahn" elastic filler and armor plates for expansion joints.

STUCCO:
National Kellastone Co., The, Chicago, Ill.

COLUMNS

WOOD:
Hartmann-Sanders Co., Chicago, Ill.

CONCRETE REINFORCEMENT

REINFORCEMENT:
American Steel & Wire Co., Chicago-New York.
Berger, The, Mfg. Co., Canton, Ohio.
Bostwick Steel Lath Co., The, Niles, O.; Bostwick "Truss-V-Rib."
Concrete Engineering Co., Omaha National Bank Bldg., Omaha, Neb.
Truscon Steel Co., Dept. 68, Youngstown, Ohio. Representatives in principal cities. "Kahn" System reinforced concrete; "Kahn" bars; "Rib" bars; "Rib" lath; "Floretyles," "Floredome," etc.; flat and beamed ceilings of all types.

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(See Water and Dampproofing)

DAYLIGHTING

Berger, The, Mfg. Co., Canton, Ohio.

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Interior Metal Mfg. Co., Jamestown, N. Y.; Bankers Trust Bldg., 501 Fifth Ave., New York. Hollow steel doors in all standard sizes.

SLIDING DOOR EQUIPMENT:
Richards-Wilcox Mfg. Co., Aurora, Ill.

STEEL ROLLING EQUIPMENT:
Edwards Mfg. Co., The, 319-349 Eggleston Ave., Cincinnati, O. Send specifications for estimate.

WOOD:
Morgan Sash & Door Co., Oshkosh, Wis.

DUMB-WAITERS

Sedgwick Machine Wks., 159 W. 15th St., N.Y.

THIS department is intended to assist our subscribers in readily determining the names and addresses of manufacturers of products in which they may be interested, together with brief data about their material.

The headings and sub-headings are arranged alphabetically and have been selected in accordance with the intent of meeting the architect's thought in preparing his specifications.

If the information desired is not found here, it will gladly be supplied by the Service Department of THE AMERICAN ARCHITECT.

ELECTRICAL EQUIPMENT AND SUPPLIES

CONDUITS AND FITTINGS:
National Metal Molding Co., 1111 Fulton Bldg., Pittsburgh, Pa. "NATIONAL" metal molding for surface wiring; "SHERADUCT" and "ECONOMY" conduits, "FLEXSTEEL" armored cable and a complete line of fittings.
Youngstown (O.) Sheet & Tube Co. "Buckeye" rigid conduit. "Realflex" armored conductor.

DOOR OPENERS:
Richards-Wilcox Mfg. Co., Aurora, Ill.

LIGHTING SYSTEMS:
General Electric Co., Schenectady, N. Y.

OUTLET BOXES:
General Electric Co., Schenectady, N. Y.
Hart & Hegeman Mfg. Co., Hartford, Conn.

PANEL BOARDS:
Structural Slate Co., The, Pen Argyl, Pa.

POWER PLANT EQUIPMENT:
General Electric Co., Schenectady, N. Y.

RECEPTACLES:
General Electric Co., Schenectady, N. Y.
Hart & Hegeman Mfg. Co., Hartford, Conn.

SOCKETS:
General Electric Company, Schenectady, N. Y.
Hart & Hegeman Mfg. Co., Hartford, Conn.

SWITCHBOARDS:
General Electric Co., Schenectady, N. Y.

SWITCHES:
General Electric Co., Schenectady, N. Y.
Hart & Hegeman Mfg. Co., Hartford, Conn.

WIRES AND CABLES (Insulated):
General Electric Co., Schenectady, N. Y.

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CONVEYORS:
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ELEVATORS AND HOISTS—Continued

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Bostwick Steel Lath Co., The, Niles, O.; 135 N. 22nd St., Phila., Pa. Bostwick "Truss-Loop" and expanded metal in three types; "Diamond A," "Niles" and "Lock."
Concrete Engineering Co., Omaha National Bank Bldg., Omaha, Neb.
Milwaukee Corrugating Co., Milwaukee, Wis.
Truscon Steel Co., Dept. 68, Youngstown, Ohio. Representatives in principal cities. "Hy Rib," "Rib" lath; "Diamond Mesh" lath.

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AUTOMATIC FIRE DOOR HARDWARE:
Richards-Wilcox Mfg. Co., Aurora, Ill.

FIRE EXIT DEVICES:
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FLOORS

COMPOSITION:
Franklyn R. Muller & Co., Waukegan, Ill.
National Kellastone Co., The, Chicago, Ill.

TILE AND CERAMIC MOSAIC:
Associated Tile Mfrs., Beaver Falls, Pa.
Structural Slate Co., The, Pen Argyl, Pa.

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Raymond Concrete Pile Co., 140 Cedar St., N. Y. C. "Raymond" concrete piles are made by driving a reinforced steel shell which is left permanently in the ground. This shell is then filled with concrete.

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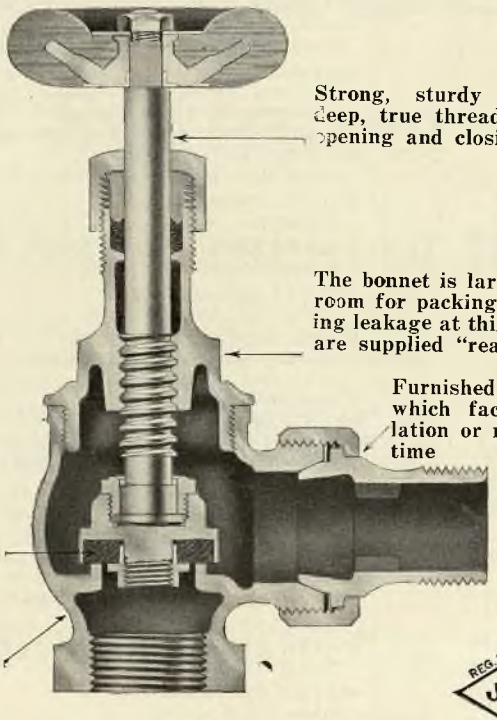
Richards-Wilcox Mfg. Co., Aurora, Ill.

BOLTS:
Corbin, P. & F., New Britain, Conn.
Sargent & Co., New Haven, Conn.

ALPHABETICAL INDEX OF ADVERTISERS ON PAGE 38

A FINISHED JOB

Jenkins Radiator Valves



REG. U.S. PAT. OFF. TRADE JENKINS MARK
Jenkins Bros

A JENKINS Radiator Valve is a *finished job* for it lacks nothing to make it a thoroughly dependable valve for heating plant service. If the heating system is good and Genuine Jenkins Valves are installed, the *job is finished,* because their construction is not only heavier but strong enough to obviate any trouble that may arise.

Jenkins Radiator Valves are made in Globe, Angle, Offset and Corner patterns with various body finishes and trimmings.

JENKINS BROS.

New York Philadelphia Chicago Boston Montreal London

Jenkins Valves

HARDWARE—Continued

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Richards-Wilcox Mfg. Co., Aurora, Ill.
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