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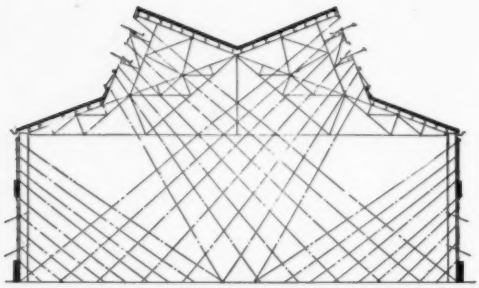

Fig. 1.—The center pivoting of Fenestra Continuous Sash provides wide openings above and below the pivoting through which abundant daylight reaches every inch of floor area. Combined with light from the side wall maximum results are secured.

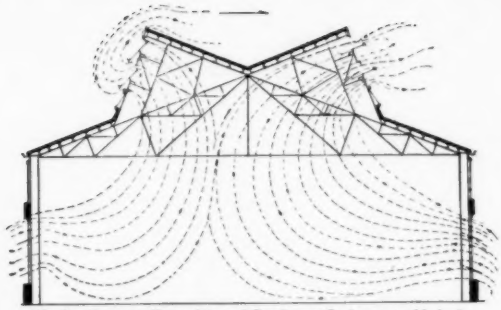

Fig. 2.—Fenestra Center Pivoted Continuous Sash opens wide in the exact direction of the flow of the air currents. Compare the straight-out passage of the air currents at the right of this illustration with the obstructed flow at the left where top hung sash is used.

Maximum Daylight Maximum Ventilation Economical Building Construction - - - - - -

- - - - - three points of superiority that recommend Fenestra Center Pivoted Continuous Sash for monitors.

When fully opened floods of daylight pour through both above and below the pivoting. Even when closed the maximum daylighting possibilities of top hung sash, whether open or closed, are duplicated.

Easy exit for stale air, fumes or gases is assured, because the sash opens in the exact direction of the flow of the air currents. A straight up and out passage is thus provided and sharp angle turns are eliminated.

Where Fenestra Center Pivoted Continuous Sash is specified, steel work can be laid out economically.

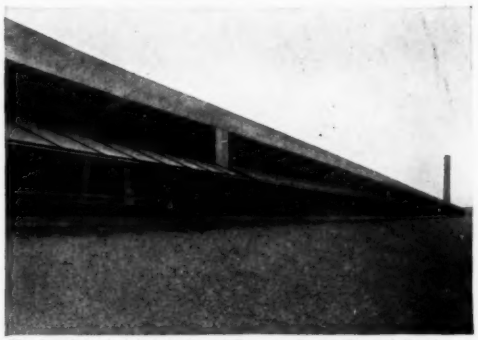

Fig. 3.—A typical installation of Fenestra Center Pivoted Continuous Sash in the Michigan Stamping Company Detroit. Note the wide openings for daylight and ventilation above and below the pivoting of the sash.

Weathering and durability meet the most exacting requirements of modern foundries, forge shops or buildings of a similar type.

The new Fenestra Monitor catalog explains the most efficient methods of securing daylight and ventilation through monitor construction. Have you received your copy?

DETROIT STEEL PRODUCTS CO.
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SOLID STEEL WINDOWS

THIRD PRELIMINARY SKETCH

THE TOWER OF THE TRAVELERS' INSURANCE CO., HARTFORD, CONN.

DONN BARBER, *ARCHITECT*

THE AMERICAN ARCHITECT

VOL. CXIV WEDNESDAY, AUGUST 28, 1918 NUMBER 2227

STUDY MADE FOR THOMAS HARLAN ELLETT, *ARCHITECT*

Base, plaster; buildings, bristol board; cardboard roofs. Trees made of sponges and dried goldenrod.

Model Making in the Drafting Room

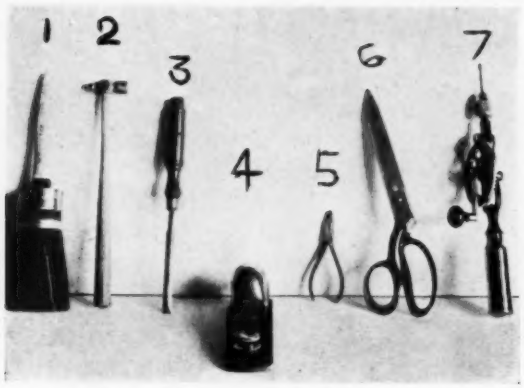
By ROYAL ROOK

TO help the architect and engineer to construct models of his projects, the different methods and materials that enter into such work are described, all of which can be used to advantage in the office of the average architect. Such materials as bristol board, compo board, card board, glue, photographic paste, paints, brushes, shellac, sand, gravel and sponges are required. These can be obtained almost anywhere.

Since different types of models require different scales of construction, it is thought best in the present discussion to consider each example separately. Some general consideration of method may be helpful, however.

As it is difficult and undesirable to make use of plaster of Paris in the office or drafting room, on account of its untidiness—and this applies also in the case of glue and piece moulds—bristol board is suggested as a substitute. As many different thicknesses of bristol board are available, it is well to secure a sample book from a dealer in paper and cardboard, in order to select intelligently the variety that is needed. There is a further advantage in that if it is desired to design or draw on this board with ink or water color, the sample may be tested before ordering.

In building up contour maps and topographical models a cheap grade of paper box board should be used. It can be had in nearly all desired thicknesses to meet the need of scale intervals, and cardboard need only be used to cover a surface that is not over two or three square inches, as there is no strength



THE TOOLS.

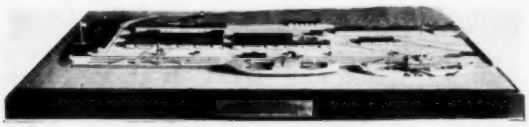
1. Dust brush. 2. Hammer. 3. ⅜-in. Chisel. 4. Plane. 5. Pliers. 6. 6-in. Shears. 7. Hand drill

to its surface when not supported by some strong background.

In cutting out the bristol board for building or architectural and engineering models a bevel-edged woodworking chisel should be used; a knife or shears should never be used as they will fracture the material and produce raw edges, which mar the perfection of the model. In modelmaking, as in everything else, the best tools are always the most satisfactory.

It is recommended that the chisel used for cutting bristol board and cardboard never be used for any other purpose. Even the sharpening of a lead pencil will spoil the cutting edge, and it will be necessary to put the instrument on the oil stone before it can be used again.

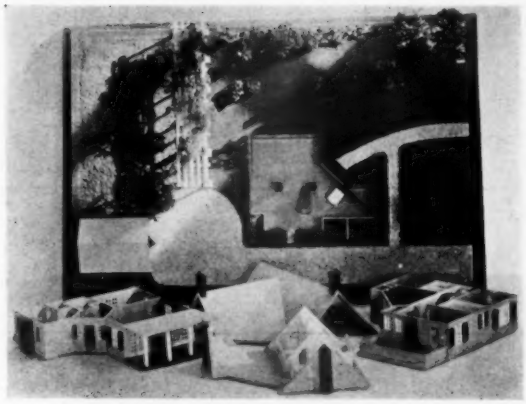
The author has used, with considerable success and satisfaction, a set of English wood carving tools, especially where small scale models were to be made. In cutting the bristol board for a model there should be a block of hard wood under the board. Some practice is necessary in order to cut bristol board successfully; the method suggested is to hold the handle of the tool firmly and press downward until the edge has cut through the board. Never draw the chisel along cutting line as you would do if using a knife. After having accurately and carefully cut the different parts of the model they should be assembled and held together by glue lightly applied to the edges that are to join. A base should first be provided, and this is to be cut to the size of the inside bottom floor measurement.



MODEL FOR EMERGENCY FLEET CORPORATION.

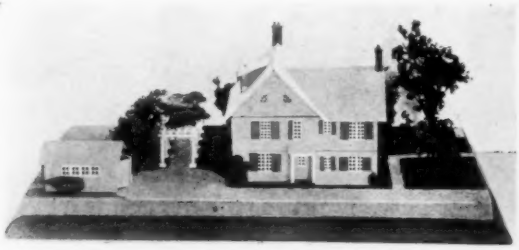
The walls should be glued in place separately,

STUDY MADE FOR THOMAS HARLAN ELLETT, *ARCHITECT*



A BRISTOL BOARD MODEL
The model taken apart

and a section of wood or bristol board, cut to a 45 degree angle, placed inside it, to act as a support and brace to hold the wall true while the glue is hardening. All the elevations should be glued in place in turn, and when they are completed braces should be installed here and there as necessary. The interior should then be shellacked. In fitting roofs to small bristol models all bends made in the roof must first be cut slightly on the outside line and a V-shaped channel cut out on the underneath parts, so that the bending will not crack the bristol board. To fit a roof, one must cut it out by checking off the boundaries with pencil marks, and cutting away until the desired fit is secured. The chimney may be

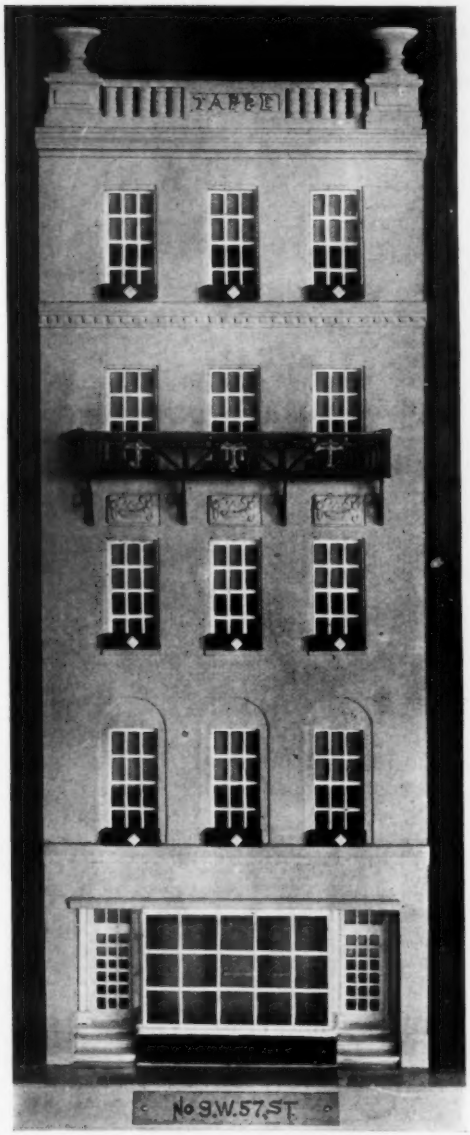


BRISTOL BOARD MODEL
The parts assembled

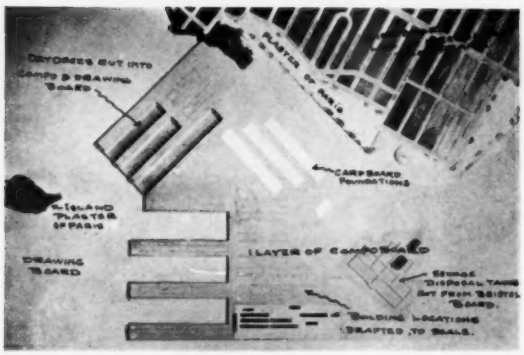
planed from strips of white pine, and should be placed in position before the roof is shellacked, as glue does not adhere readily to shellac.

If water color or ink wash is contemplated for outside rendering of architectural details, the outside of the model should not be shellacked. When it is planned to paint with oil, on the contrary, the surface must have a coat of shellac.

Before starting the work serious consideration must be given to the scale. The necessity for transporting the model through doorways and elevators, so that it may be exhibited readily, must be borne in mind. When the scale has been decided upon a carpenter should be employed to make a wood frame, on the plan of a checkerboard, of 1 in. x 3 in. white pine, with inside braces countersunk, glued and screwed in place. One side of this frame should be covered with compo board, glued and nailed



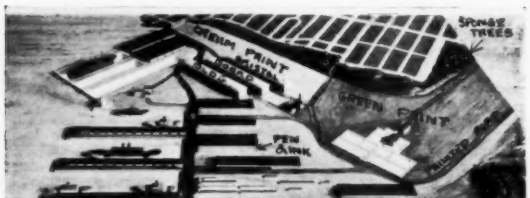
A BRISTOL BOARD MODEL
Window sash laid with glass. Show windows, sheet celluloid.
KENNETH M. MURCHISON, *ARCHITECT*



FIELDS POINT MODEL
First Stage

every three inches all over the frame work. This makes a strong and rigid base upon which to build the model. It is not practicable to use drawing boards for the bases of models; they are heavy and expensive and available only in stock sizes.

As showing what may be accomplished under stress of necessity, illustration is given of the sim-

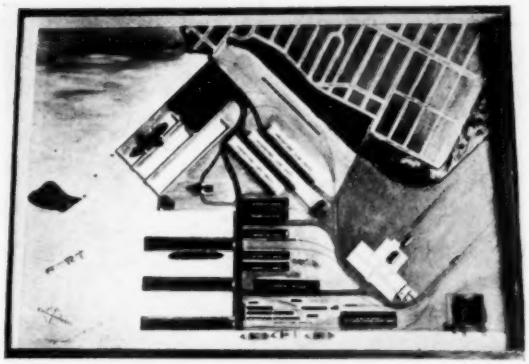


FIELDS POINT MODEL
Second Stage

ple tools used for the models of Fields Point and Lord Construction Co. Emergency Fleet Corporation. This set should not be considered complete nor adequate for turning out fine work. A set of chisels should consist of 1/16 in., ⅛ in., 3/16 in., ¼ in., ⅜ in., ½ in., ¾ in., 1 and 1½ in.

If it is necessary to use plaster of Paris for certain purposes, the finest quality should be purchased. It should be mixed with water in a china bowl or enamel pan. If a quarter teaspoonful of glue is added to the mixture it will retard the setting of the plaster. To carve plaster, the surface should be wet and cutting should be done with steel tools, such as chisels and plaster-working tools, which may be purchased at artists' supply shops.

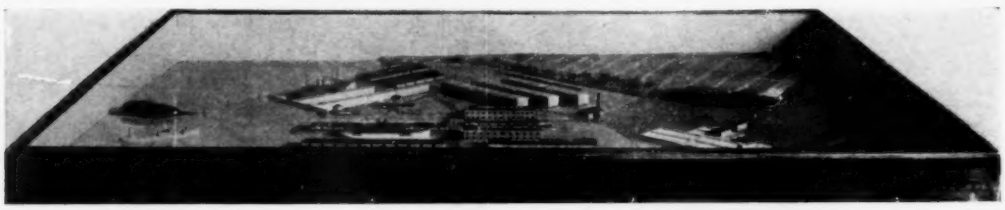
In mixing the plaster with water, shake the plaster into the water gently to prevent air bubbles forming in the mass. The mixture must not be beaten, but should be stirred gently from the bot-



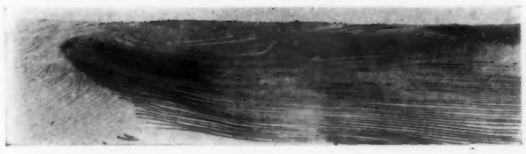
FIELDS POINT MODEL
The Finished Work

tom with a stick. Plaster should be added until the mixture is thick enough to prevent running. Plaster will stick to any article that has first been coated with shellac, and plaster members which have hardened may be made to adhere by shellacking back parts of the surfaces, pressing them firmly together and allowing the shellac to dry. To remove plaster from bowls, tools and the like, soak in kerosene oil.

Taking the model of Fields Point as the first subject for description, a series of cuts shows the work under construction, marked by names of materials used in its making. This model was made on a scale of 1 inch equals 100 ft. It measures 3 ft. wide



FIELDS POINT MODEL
Finished—under Glass



CONTOUR MAP, MADE OF LAYERS OF CARD BOARD

CAST TAKEN FROM CARD BOARD CONTOUR MODEL

by 4 ft. 7 in. long. The base is a drawing board with one sheet of compo board cut out and glued and nailed to it to represent the ground surface. On this ground surface the locations of all buildings, steamships and piers were indicated. There was a hill to model in this work, and for want of time and material, and to save making a contour relief map and filling in the intervals with plaster or modeling clay, from which a model and cast would have to be made, a more elementary method was used. From a 7/8 in. board of white pine strips were cut out the shape of the different elevations, and these were nailed and glued into place in a checker board effect. To the top of this a sheet of heavy bristol board was glued, on which all the city blocks had been glued. This gave the effect of streets in relief. The park land was made of plaster of Paris, spread on copper screenings to reinforce and hold it.

The buildings were made of bristol board with the architectural details drawn on with colored ink. The boats were carved of wood and ground work and water painted with oil paints. Slices of sponge were fastened to the island and park with shellac and were painted green after the shellac had hardened. The model of the Lord Construction Co. Emergency Fleet Corporation was made on a scale of 1 inch equals 20 ft. The base was made on a checkerboard frame with a layer of compo board on it. This represents the water level. For the ground work of the shipyard, two layers of compo board, glued together, were nailed in place. Bristol board the shape of the building foundations were glued on and strips of bristol the shape of railroad tracks were also placed. All of this was then shellacked. The hill in this model was made of copper wire screen covered with plaster. The entire surface, excepting only the water and building sites, was then coated with heavy varnish. Fine sifted beach sand was sprinkled on the wet varnish, and a coarse mixture of bird gravel on the plaster hill. After this had dried well the loose sand was brushed off and the entire surface painted with flat oil paints to represent ground conditions. The buildings were of bristol board with windows and doors cut out. They were painted with four coats of flat white and black ink to represent half timber work. The railroad cars were made of cardboard and the tracks and ties were painted on cardboard strips.

MODEL OF HOSPITAL AT MOUNT McGREGOR, NEW YORK.
D. EVERETT WARD, *ARCHITECT*

A scale of 1 in. equals 32 ft. was used for the model of the Metropolitan Life Insurance buildings. The base was made of plaster composition moulded from a clay model that was built up of bristol board to represent 5 ft. intervals. The buildings were cut out of cardboard after the architectural and color work had been completed. The roofs of these buildings were painted with a flat oil paint, the roadways and walks were painted a straw color, and all other ground work was done in different shades of green. Trees were made from sponges clipped to the shape of cedars, and from dried clover blossoms and golden rod, painted in varying shades of green. Two thousand of these dried plants were required to represent this landscape work. The lake was indicated by a sheet of glass, varnished on the under side, and waved through with Prussian blue and chrome green while the varnish was wet. A space in a grove was cut out and the bottom of it sprinkled with sand pebbles. These were painted and then varnished to give a neat appearance under the glass. To fasten trees on plaster models, holes must be bored to receive the stems or trunks, which must be modeled from wire nails on very small natural wood twigs.

The cut of the model house showing the interior arrangement of cellar and all floors was made on ⅛ in. scale from No. 12 ply bristol boards. The window sash were cast from bronze moulds of soft metal, but for these one may substitute painted ones rendered on cardboard, such as the ones shown in the illustration of the Thomas H. Ellett study model. This house model has all windows and doorways cut out. The entire building was painted in flat cream white; strips of card were placed back of windows and checked off for location, so that when replaced they would fit in the same position. The sash effect was then worked in with ink and water color paint, with excellent results. The groundwork of this model was plaster, and the trees and color work were done in the same manner as the Metropolitan Life Insurance Company's model.

Preservation of Architectural Models

A PRESENT infraction, in the larger architectural offices of this country, of the rules of conservation and "no waste" is to be observed in the matter of architectural models. While this is an aspect of the matter which is of comparatively little consequence, it is interesting to consider in what way greater utilization could be made of the elaborate small-scale structures which are to be found in many of these offices. It has become the practice to have prepared models, illustrating either wholly or in part, the completed effects contemplated by their designs. These models, in addition to helping the client to visualize the finished structure, are often very enlightening and valuable to the architect himself.

In addition to these small-scale models of entire buildings there are constantly being made full-size models of ornamental work and decoration, samples of work in such materials as iron, bronze, marble, and some of them, if properly selected and housed, would form a valuable and interesting collection. They would also serve to increase the general architectural knowledge of the lay public.

Under present conditions these architectural models, after they have served the purpose for which they were intended, are set aside in some obscure place, and finally become so shabby, through abuse and neglect, that they are broken up and thrown away.

In all the larger museums of the Fine Arts in this country there are rooms devoted to architecture in which photographs of old-world buildings and models of certain of the most renowned classics are included. In addition to these permanent exhibitions of the architecture of the past, might it not be possible to present the good, and occasionally great work of this and recent generations? To give proper prominence to these office models, which oftentimes are more fully imbued with the spirit of the designers and his ideal than the finished product? Could there not be provided facilities for exhibitions, less permanent in character, of the best in current architectural work? And from such collections, selection might be made of those rare works worthy of a permanent place in our museums.

One of the chief criticisms commonly made of these institutions is that they have an atmosphere too musty and savoring too much of the archæological to be truly representative institutions. The work of modern times is slighted and ignored, the criterion seeming to be a matter of age, in many cases. This is true in every field of artistic endeavor, but in no case is it more apparent than in the case of architecture. A system of carefully organized exhibits, of a more or less temporary character as described above, would serve to improve this condition materially, and would doubtless prove of advantage to the institutions in question.

The scope of such undertaking might be immeasurably increased if it were to include the various arts and crafts allied with architectural design. They would be greatly stimulated and developed through such consideration and their artistic merits would be bound to grow in the same measure as the architect would be inspired by such contacts.

Comparing the Bids and Letting the Contract

By W. F. ANDERSON

WITH the plans and specifications approved by the owner and ready to receive tenders, the architect should take up the question of the form of proposal blank to be issued to the bidders. If the standard documents of the American Institute of Architects be used he cannot do better than to employ the form prepared by that body. Where that is not the case he must use one of his own, if he would feel assured that all bids will be submitted on the same basis. This is particularly true when the specifications provide for a number of alternates. From long experience the writer is convinced that otherwise it will often be very difficult to be sure that what appears to be actually is the lowest bid when the figures are tabulated.

To take up the form of the proposal first: If the architect wishes to use his own printed form, one along the lines of Figure 1 will be found to be very convenient and at the same time to contain nothing to which any bidder could, in good faith, take exception.

Where such a printed form is not considered advisable or necessary it is advisable that the architect send out with the plans circular letters instructing the bidders to copy the proposal on their own letterhead, dictating the form to be used on substantially the same lines, condensed somewhat as follows:

Proposal for
Residence for Joseph Brown, Esq.,
at Westfield, N. J.

To B. S. Williams, Architect.

Dear Sir:

We hereby agree to furnish all labor and material required for the erection and completion of above building in full accordance with the plans and specifications prepared by you for the sum of $..... We further agree that the owner shall have the option of accepting or rejecting any or all of the Separate Estimates below mentioned at the prices quoted herein.

Note—Here insert the separate estimates as in Figure 1.

We further agree, in case this proposal is accepted to complete the work on or before.....(or in .....working days).

When the bids are received in either of these two forms there can be no question as to their relative standing.

On the other hand, when the architect has not dictated the form to be followed, will he not often receive bids varying as widely in provisions as follows:

Mr. B. S. Williams,

Dear Sir:

I hereby agree to build house for Joseph Brown, Esq., per your plans and specifications for.....

Respectfully submitted,

or

Mr. B. S. Williams,

Dear Sir:

I estimate that it will cost ..... to build house for Joseph Brown, Esq. I have counted on using hemlock for all lumber and stone from old walls on property.

Very truly,

Bidder No. 2 may be quite as honest and capable as No. 1, but you either have to throw out the bid or have it rewritten before you can be sure that it will stand on an equal footing with No. 1.

Figure 1 shows on its face a number of alternates, indicating the owner's desire to take advantage of certain options, either before the signing of the contract or during its progress. If properly handled most, if not all, contractors will agree to such a provision. Attention is called to the introductory note, which is inserted to save time and typing. Where a specification may contain six or more alternates, some covering two or three paragraphs, it becomes too bulky to repeat in the proposal blank.

With the bids all in hand the architect can proceed with his tabulation, and in a very short time can present to his client a sheet as illustrated in Figure 2.

Let us assume that the client is favorably impressed by this showing and wishes to make a con-

tract with the low bidder. The architect should then call in the contractor and go over his bid with him, to see how it is made up; and the author personally has never known of a case where this request was not complied with cheerfully.

If a printed form of proposal is used the various subdivisions required can be printed on the reverse side ready for use. If not they can be prepared by the architect and filled out by the contractor. As a rule the general sub-headings of the specifications, according to trades, will be found sufficient, and can be subdivided as required by the particular case.

With this information in hand and details settled we are now ready to draw the contract.

Where both parties to the agreement are willing to use the latest edition of the standard documents of the American Institute of Architects it is probably advisable to use that form, but sometimes it is not used and it becomes necessary to employ some other form.

It is the intention in this paper only to touch on this subject generally and to illustrate by example the most important things, which if not already covered in the general conditions attached to the specifications should be written into the agreement (commonly called contract).

1. *Scope of work.* After the date and the names of the parties to the agreement should be stated the scope of the work covered thereby, and the most comprehensive method is to quote the title on the plans and specifications exactly as worded on those documents.

2. *The time of completion.* This will be as defined in the proposal. If it is on the basis of working days, the exact meaning of the phrase should be made clear.

3. *Additional work.* A clause requiring the contractor, on written order of the architect, issued at direction of the owner, to do work on a net cost plus commission basis. What items shall or shall not be allowed under the definition of "net cost" should be stated.

In connection with this note that as in most states a compulsory workman's compensation or liability insurance law is in force, this should be specifically included as being covered in the definition.

4. *Contract Documents.* The various documents making up the complete contract should be specifically listed and be identified by the signatures of the parties to the agreement.

5. *Fire Insurance.* Whether by contractor or owner to cover interests of both parties or by both jointly to cover individual interests. To the writer it appears wiser to include this clause in the general conditions attached to the specifications, so that at the start the bidders all know what provision to make.

6. *Price.* When the contract is made for a lump sum, the following short form is recommended:

> The owner agrees to pay the contractor in current funds for the performance of this contract, subject to additions and deductions as provided in the General Conditions of the Contract, the sum of ——.

When provision must be made for alternate estimates, they should be included here; as for example:

> It is furthermore agreed that the owner has the option of authorizing the work of erection and completion of the Billiard Room Wing at an additional cost of $....., provided that written notice of such intention be given the Contractor on or before.....

When the contract is made on a cost and commission basis a clause like this is recommended:

> It is hereby mutually agreed by the parties hereto that the sum to be paid by the owner to the contractor for all labor and materials and completion of the work contemplated by this contract shall be,—the net cost to the contractor for all labor and materials incorporated in the building under this contract, together with ten per cent thereon, in full payment of the Contractor's profits, and in compensation of his undertakings and agreements thereunder.
>
> It is mutually agreed that the following items shall be included in the net cost:

Then follows a list defining just what items are to be charged and what will not be allowed.

Under this form of contract a clause permitting examination of accounts should always be inserted; for example:

> The contractor shall at all times permit the owner or his duly authorized representative to examine his books and vouchers pertaining to such work as may be authorized and executed under this contract.

7. *Payments.* Payments may be made either on a basis of monthly payments during satisfactory progress of the work, or on a schedule of fixed sums to cover certain clearly defined stages of completion.

Under the first method not less than 10 per cent of the estimated value of work done each month should be held back until the entire work is completed.

It should be clearly stated that progress payments are not to be assumed in any case as an acceptance of defective work or materials.

For this reason the issuance of the architect's final certificate should be guarded by a protecting clause on these lines:

> When the work contemplated herein has been satisfactorily completed, and all additions, deductions and allowances have been adjusted satisfactorily and the architect shall have furnished a certificate showing such satisfactory completion, and the amount due to the contractor hereunder, and the contractor shall have furnished satisfactory proof to the architect and owner that there are no out-

standing liens or claims for materials furnished or labor performed on or against the property or structures which are the subject matter of this contract, and that there is no claim or lien for which the owner would become liable in connection with this contract, then the owner shall within thirty days thereafter pay to the contractor the balance due hereunder.

These clauses will cover in almost every case all of the inserted matter required in any building contract. The legal phraseology governing the opening and closing paragraphs will be found in any printed contract form.

FIGURE 1

Proposal form to accompany plans, specifications and contract from
OFFICE OF
B. S. WILLIAMS
ARCHITECT

Date of issue, New York,.....August 1st,.....1918.

Plans and Specifications to be returned by.....August 14, 1918.

Proposals to be submitted by..... August 16, 1918.....

PROPOSAL

Owner's Name.....Joseph Brown, Esq.,.....

Location of Work.....Westfield, N. J.....

Kind of Work.....General, Covering House and Garage.....

Dear Sir:

Having carefully examined the plans and specifications, including the general clauses thereof, the undersigned hereby proposes to furnish, subject to the various conditions therein set forth, all materials and labor of every character and description called for in the specifications under the above heading, together with that indicated on the drawings in connection with said specifications, all as prepared by architect and in strict accordance therewith for the following consideration:

For work under specifications for House, $.....
" " " " " Billiard Room Wing, ...
" " " " " Garage, ...
TOTAL $.....

SEPARATE ESTIMATES

The price quoted for specifications under House is further subject to the following separate estimates under conditions laid down in the specifications:-

Estimate #1. If gravel is supplied free DEDUCT $.....
" #2. If sand is supplied free " $.....
" #3. If concrete floors in 115 and 120 are changed " $.....
" #4. If shingling is changed " $.....
" #5. If the small boiler is omitted " $.....

.....

.....

And the undersigned further agrees, in case the above proposal is accepted, to complete the work with respect to time .....

Signed

Bidder.

FIGURE 2

TABULATED BIDS. WORK FOR JOSEPH BROWN, ESQ.

Name	House	Billiard Room	Garage	Total	Alt. 1 Deduct	Alt. 2 Deduct	Alt. 3 Deduct	Alt. 4 Deduct	Alt. 5 Deduct
Bidder No. 1.....	70,150	8,500	7,500	86,150	1,150	500	450	3,500	300
Bidder No. 2.....	71,500	10,000	8,550	90,050	1,500	400	250	3,750	350
Bidder No. 3.....	79,600	8,750	7,750	96,100	1,150	400	300	2,300	300
Bidder No. 4.....	82,750	9,500	8,650	100,900	1,350	550	300	2,350	350

TOWER OF TRAVELERS' INSURANCE CO., HARTFORD, CONN.
DONN BARBER, *ARCHITECT*

The Tower of the Travelers' Insurance Co., Hartford, Conn.

DONN BARBER, *Architect*

THIS tower, which is an architectural landmark in New England, rises 525 feet above the curb, and in its architectural design and general treatment may be considered as a very important addition to the already large number of office buildings of this company. It is of special interest to note that the Travelers' Tower, differing from other similar structures in this country, is not exactly square at its base and does not become so until a height of 400 feet above the ground has been reached. For this reason the tower, when viewed from the north or south, shows a considerable breadth which diminishes at several successive points until the tower finally becomes square. Viewed from the east or west this structure is but 47 feet wide. Viewed from the many points at the great distances from which it is visible, it has as many moods and aspects as there are numerous points of view.

As will be noted by the illustrations, it has been designed in the style of free Renaissance, and in its planning is adaptable to present commercial requirements, which demand a many-storied structure pierced with frequent and large-sized openings. The tower addition, which at its base measures 47 x 128 ft., in effect carries the architecture of the main or original building up to the level of the fifteenth floor. The sixteenth floor is treated as a horizontal band, the seventeenth and eighteenth as an arcade motif. The twentieth, twenty-first and twenty-second floors form a base for the three floors above them, which are treated as an Ionic colonnade. Above the cornice of this colonnade the tower becomes square in plan, and the crowning feature is symmetrical on all sides. The tower has free standing Doric columns at each of the four corners, and a deep Palladian arched treatment with balustrade on the center of each face. This loggia section is capped by a pyramidal-shaped roof, which in turn supports a final turret or lantern which tops the entire composition.

The architectural composition of the tower is somewhat unusual in the fact that its north and south façades are flush and rise cliff-like from the bottom to the top. The silhouette is obtained by setbacks and recesses in the long dimension.

Comparing this structure with other similar towers, the Hartford *Daily Courant*, in a special article, states:

"Comparing generally the architectural proportions of the Travelers' Tower with a few similar important existing examples, the ratio of its height to its narrowest width is 1 to 10½. That is, its end or narrowest face is about the proportion of a Corinthian column. The Washington Monument and Obelisks generally have a ratio of 1 to 11. St. Mark's Campanile in Venice is about 1 to 9; the tower at Cremona, 1 to 9½; Madison Square Garden in New York, 1 to 9—its prototype, the Giralda in Seville 1 to 6; the Metropolitan Life Tower in New York, 1 to 8½; the Bankers Trust Company in New York, 1 to 6.

"Comparing the relation of height to the main building of which it forms a part, the Travelers' Tower is four times as high as the main building—which is about the relation of the Victoria Tower in London to the House of Parliament, and about the same as the relation of the tower to the main structure of the Madison Square Garden in New York. The lantern of the Capitol at Washington is three and one-half times the height of the main building; St. Mark's tower in Venice is about five times as high as the Libreria adjoining and the Doges Palace. There will be a bank of six elevators serving the tower, all running to the twenty-first floor, and two continuing to the twenty-fourth. The building has concrete floors, covered in most instances with battleship linoleum, marble baseboards, copper-covered wood work and steel trim."

Paternalistic Control Should Not Be Permanent

It is to be hoped, stated Otto H. Kahn in a recent address, that the paternalistic control of enterprise and industry, which is a necessary measure in war time, will not be permitted in our country to grow into a permanent feature of our governmental system, and that as soon as possible the fetters now placed upon private initiative and personal incentive will be removed and the genius of American individual enterprise set free again, with due regard, be it understood, for the welfare and opportunities of the masses of the people and for the duty of the State to protect those least able to protect themselves and to prevent exploitation or oppression, undue privilege and unfair practices.

FIRST PRELIMINARY SKETCH

SECOND PRELIMINARY SKETCH

PRELIMINARY SKETCHES, TOWER OF THE TRAVELERS' INSURANCE CO., HARTFORD, CONN.

DONN BARBER, *ARCHITECT*

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VOL. CXIV AUGUST 28, 1918 No. 2227

No Loans to Non-essential Industries

IT is reported from Washington that all banks have been requested to conserve credits and restrict loans to non-essential industries. This will revive the much-repeated question, "What are non-essential industries?" Inasmuch as the Government by this action tacitly declares there are non-essential industries, it would seem reasonable to expect that it would endeavor to set down just what work might at this time be considered essential and what might not. Specific answer has not, however, been forthcoming, and in each case the answer to an application for a loan or an extension of credit will be found in its acceptance or rejection by the bank where such application was made.

The Federal Reserve Board in its August Bulletin referring to the many inquiries received with respect to a definition of non-essential industry says:

"Such inquiries can be specifically answered in but few cases. The question must be determined in each case by local bankers after conferring with the business men of their communities and after a careful study of existing conditions. Reasonable discretion should be exercised and drastic steps calculated to bring about hardship or embarrassment or to work injustice should be avoided. The banks should endeavor to divert the use of their credit more and more into productive fields, where its employment will result in augmenting the national resources."

This delegation to bank officials all over the country of powers to reject loans which it would seem at this time should be properly exercised by the Government will undoubtedly lead at the very outset to a conflict in decisions. We can anticipate the rejection of a loan for a certain purpose in one locality freely granted to an exactly similar one in another. And it is quite possible that favored and valuable patrons may be able to secure funds for certain operations when less fortunate ones may find the sources of financial assistance closed against them.

It is pertinent to make inquiry if building operations in the broad sense of ante-war days are or are not "in productive fields where the money expended would result in augmenting the national resources." We are prepared to learn that in many instances money for building will not be readily forthcoming, and that with equal inconsistency it, in many cases, will.

This hydra-headed determining body cannot serve the best interest of the country, and it is safe to predict that when it fails to work justice toward all the industries affected, there will be a better and more sound way provided to acquaint the investor at the very outset with just what his chances are of financing his proposed operation.

The Future of Government Industrial Villages

ON the occasion of war in every country during the past fifty years a large part of an enormous expense has been the abandonment as useless on declaration of peace of vast quantities of supplies and munitions and of many projects brought only to partial completion. This unavoidable loss, this "scrapping" of perfectly good material, has been regarded as unavoidable waste.

A source in which in this country there will be great loss is to be found, it is believed, in the vast industrial housing operations now being carried forward by the Government and the many large corporations engaged on Government contracts.

As most of these contracts are placed by the Government, contingent upon their cancellation all or in part, in the case of a declaration of peace or at the option of the Government, there will then be a decided diminution in output and an equally decided outflow of labor to other localities.

Let any of the numerous shipyards, where large housing schemes are under way, be taken as an example. When these essential plants are being

speeded up to the limit of human endeavor, and labor to carry forward the work is sought in every direction, the problem of affording such housing as would keep the men contented with their jobs is of the very highest importance.

In the event of peace there will necessarily be a very decided slowing up of work, and in some cases there will no doubt occur a complete cessation. With these conditions the need for labor will be lessened materially; many men will seek other and often distant fields of employment and there will be a corresponding vacating of houses. Where may the Government look for tenants for these vacant houses? The question is difficult to answer. In most instances these housing developments at shipyards are in locations not always of easy access, and where it would, in most cases, be difficult to reconvert the shipyards for manufacturing purposes of sufficient magnitude to retain enough labor to fill the vacant dwellings.

Dwellers in Western cities are familiar with the desolate aspect of "boom towns," whose grass grown streets and vacant houses are ghostly reminders of a once prosperous community. Or, to cite an example directly connected with governmental operation, we have for contemplation the site in suburban Philadelphia of the Centennial Exposition. While many of the buildings were razed, a group of so-called "permanent" structures remain. These at the time of their erection were hailed as indicating the dawn of our architectural rebirth. To what base usage are they now become! Better to have taken them all away. In their present condition and use they are not inspiriting.

To return to a contemplation of the future of our governmental industrial towns, it is not possible that under the conditions which will exist when peace is declared labor can be induced to stay, and it is probable that there will be an hegira that will resemble the boom town in the West.

In the case of large and independent corporations, whose plant and industrial village are fixed locations, these conditions will not become so acute, although there will probably be a falling off of the labor population. But the ship villages are not so secure as to their future prosperity, and it will be interesting to watch the future of the communal centers on which so much good effort has been set and so large a sum of money expended.

Undoubtedly there is a solution to this problem, but its successful demonstration can, of course, be afforded only by actual experience. At the same time the matter offers many opportunities for the presentation of personal opinion, and it is thought that a free discussion of the questions involved will bring out many important aspects of the case. In view of this, the editors of THE AMERICAN ARCHITECT will welcome any expression of the views of their readers on this important subject.

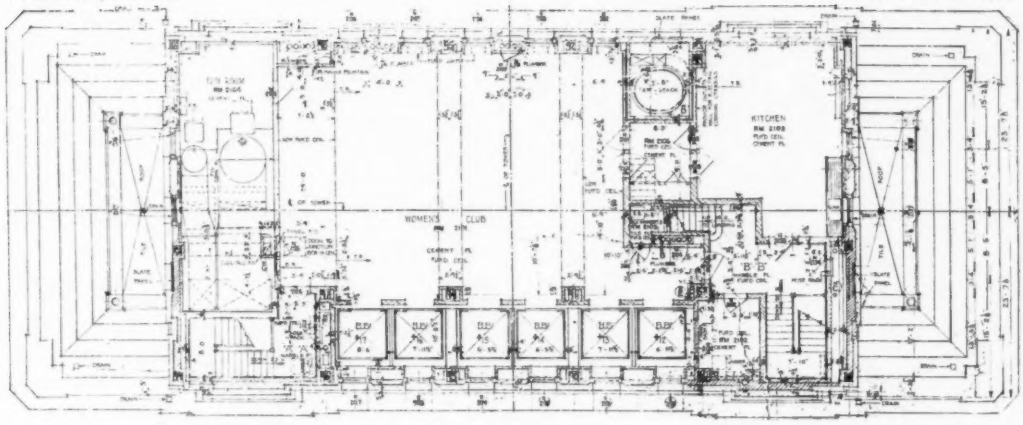
July Fire Losses

PEACE records its volume of preventable losses no less than war. It is staggering to learn that in spite of the well-directed efforts of fire prevention societies, whose operations have received the substantial support of both governments, the fire loss in the United States and Canada during July reached a total of $24,537,000, more than 50 per cent greater than the corresponding loss of the same month last year. Further, the total loss so far this year is $168,560,000 as compared with $158,765,000 for the same period in 1917.

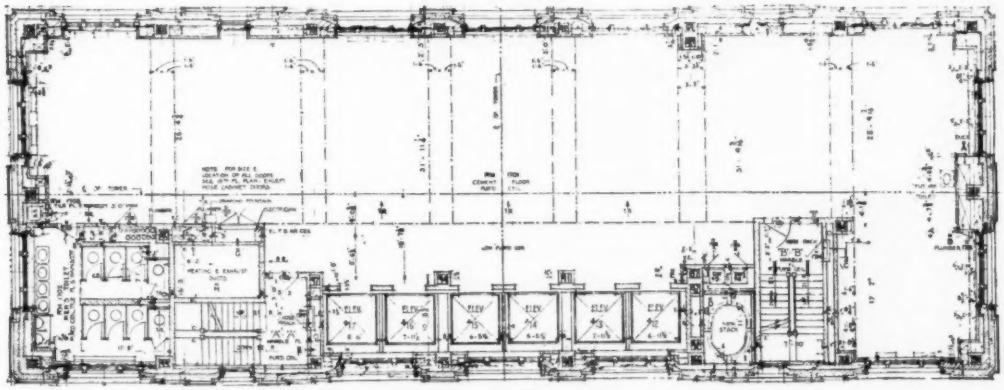
Fires in munition plants, due no doubt to enemy incendiarism, and the Black Tom Island fire, which resulted in an $11,000,000 loss, have largely increased the total this year. Yet the figures show that the balance is made up of the usual widely scattered fire losses all over this country and Canada, and the tabulation of the "preventable fires" is one which suggests that the time has come to treat with the utmost rigor the owners of property where such preventable fires occur.

At a time when we are urged by the Government to conserve everything of daily need that we can, when our allowances of wheat and sugar and coal, to name but the more important items, are being shortened, it seems unreasonable that those responsible, either directly or indirectly, for the enormous loss by fire, should be free from the punishment for carelessness and indifference bearing such outrageous results. These things are bad enough in times of peace, but now they are criminal. The preventable fire should be in the same class with arson, and the punishment therefor graded with respect to the degree of actual carelessness shown and the loss involved.

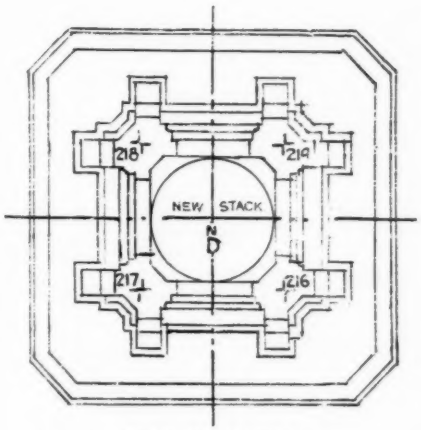
Naturally we are busily engaged just now with the weighty obligations of a nation at war, but it is to be hoped that among the reforms which will result from the awakening of the people to the real meaning of conservation, contributory negligence in fire loss shall eventually receive the punishment too long withheld.



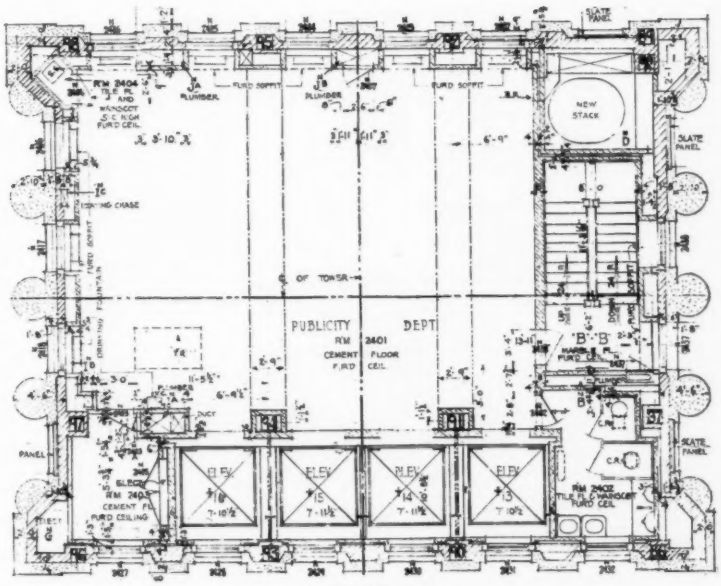
21ST FLOOR PLAN



17TH FLOOR PLAN



PLAN OF CUPOLA

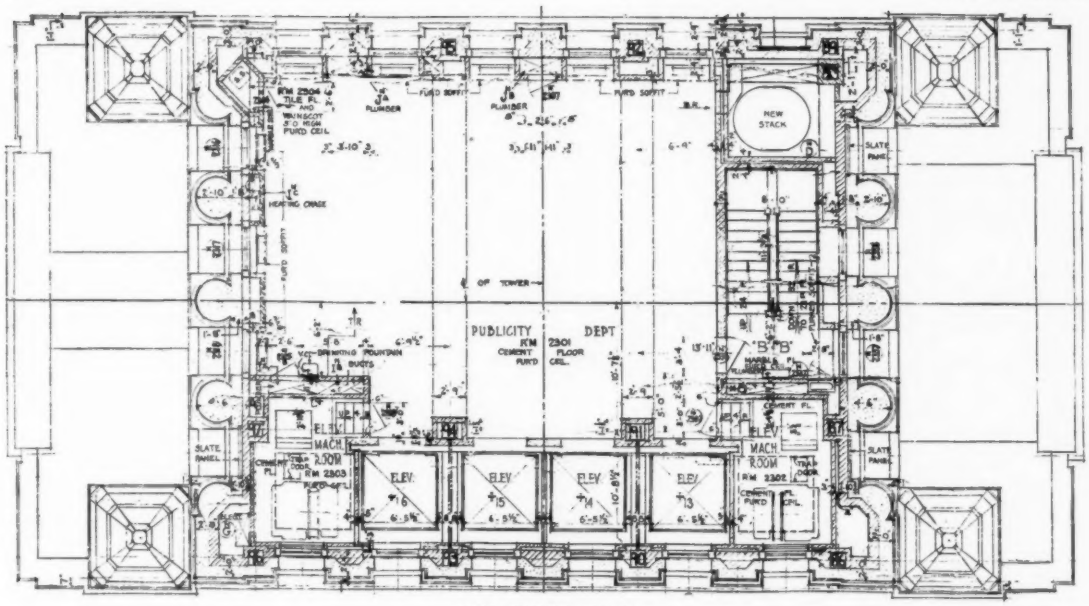


24th FLOOR PLAN

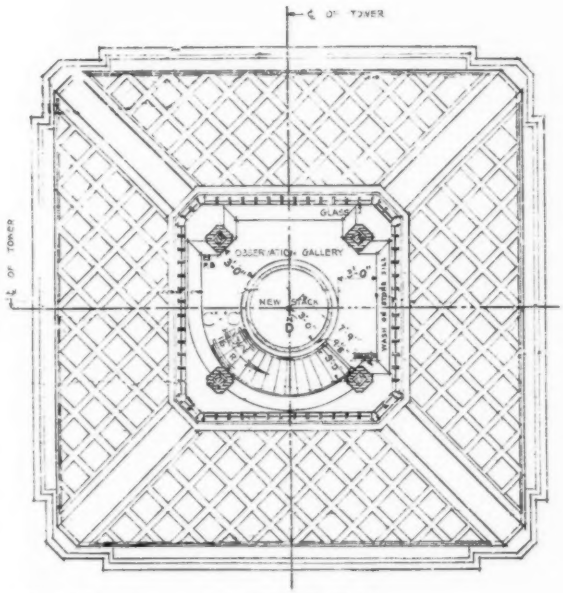
PLATE 69

TOWER OF THE TRAVELERS' INSURANCE CO., HARTFORD, CONN.

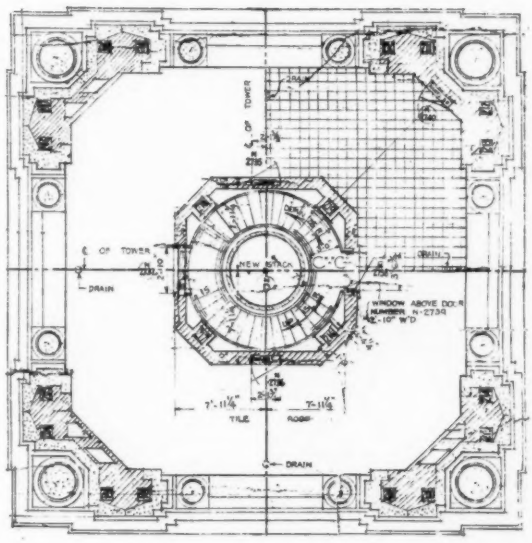
DONN BARBER, *ARCHITECT*



23RD FLOOR PLAN



34TH FLOOR PLAN

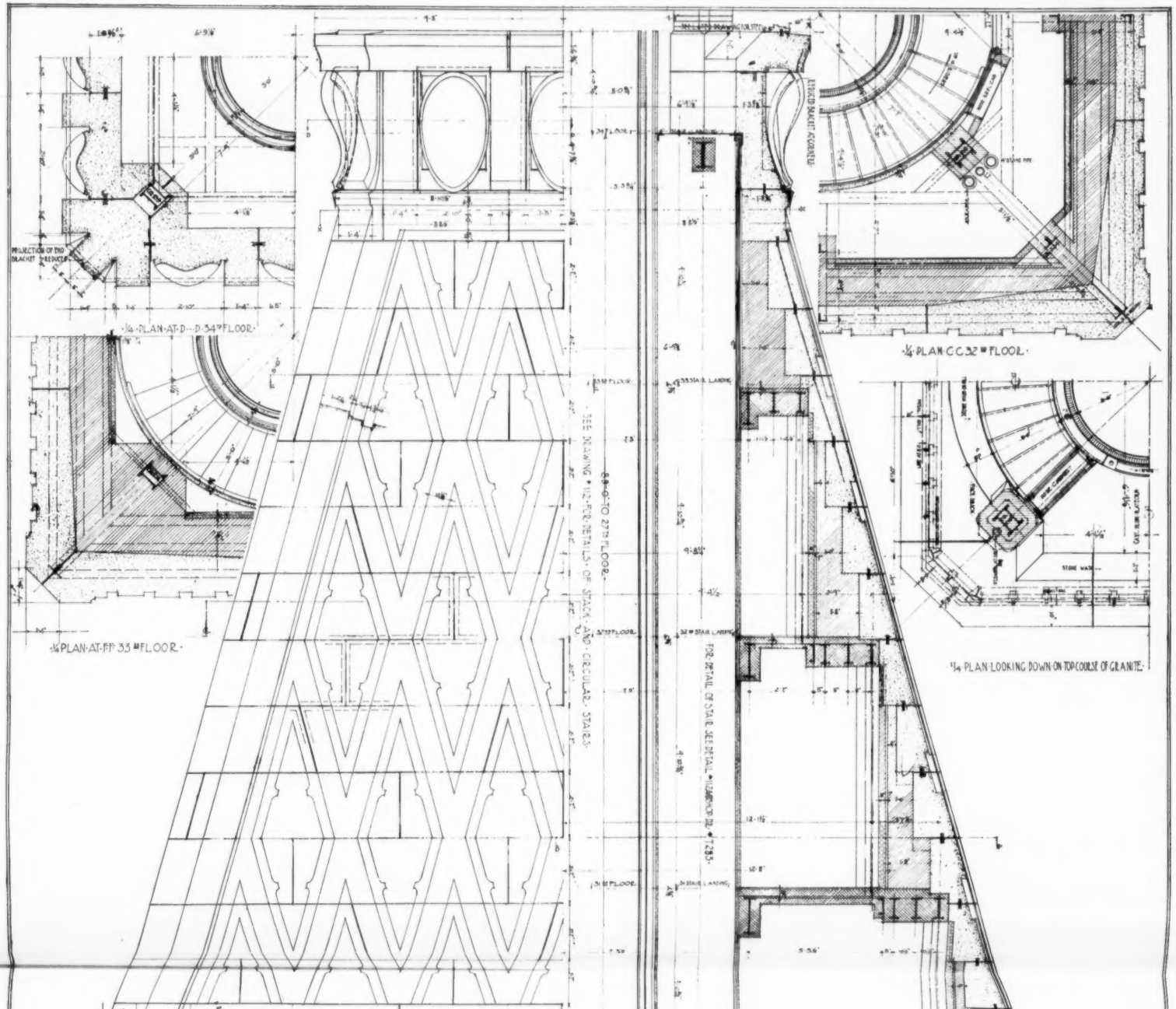


27TH FLOOR PLAN

PLATE 70

TOWER OF THE TRAVELERS' INSURANCE CO., HARTFORD, CONN.

DONN BARBER, *ARCHITECT*


¼ PLAN AT D—D 34TH FLOOR
¼ PLAN AT FF 33RD FLOOR
¼ PLAN C-C 32ND FLOOR
¼ PLAN LOOKING DOWN ON TOP COURSE OF GRANITE
SEE DRAWING #112 FOR DETAILS OF STACK AND CIRCULAR STAIRS
68'-0" TO 27TH FLOOR
FOR DETAIL OF STAIR SEE DETAIL #1235

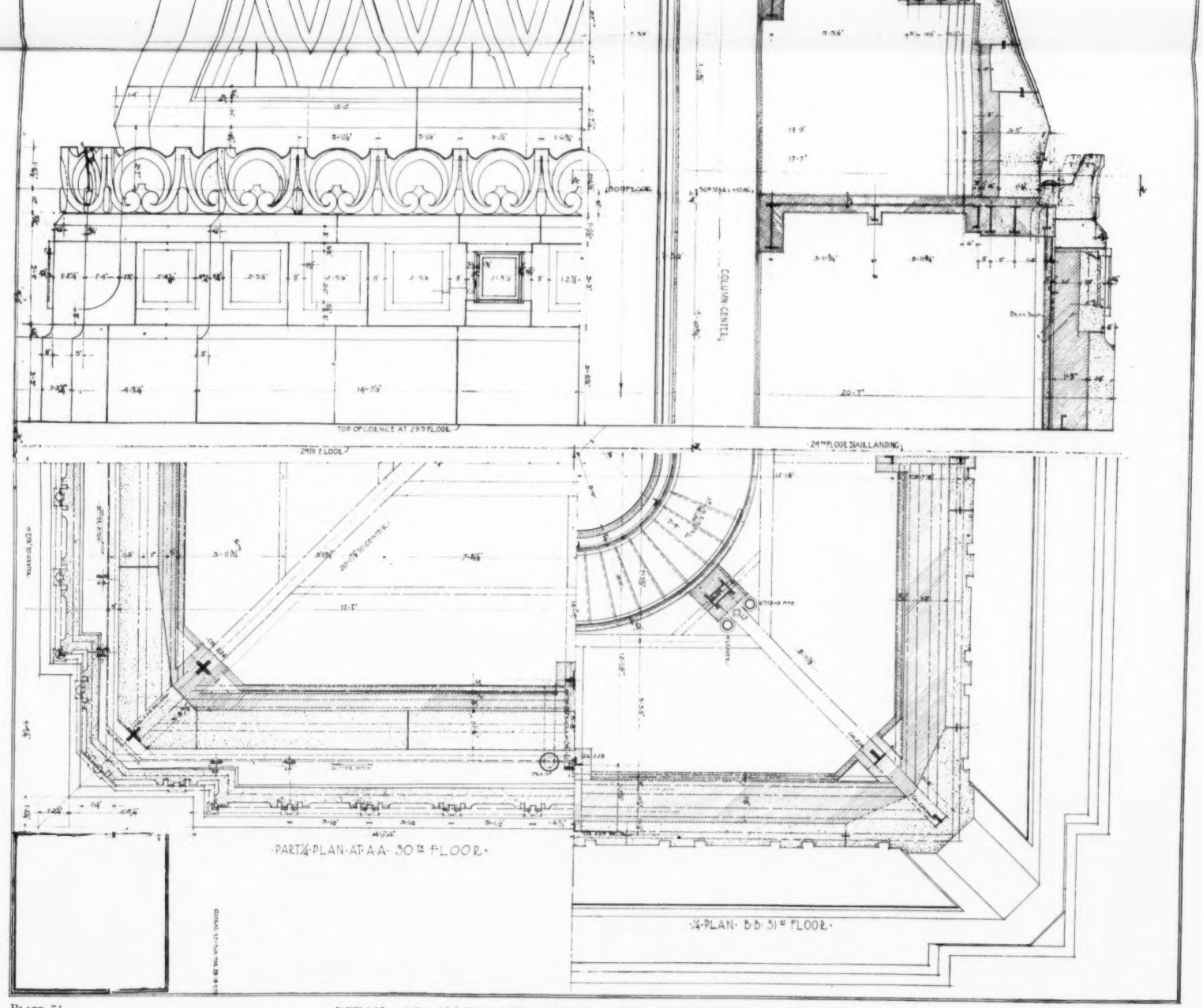
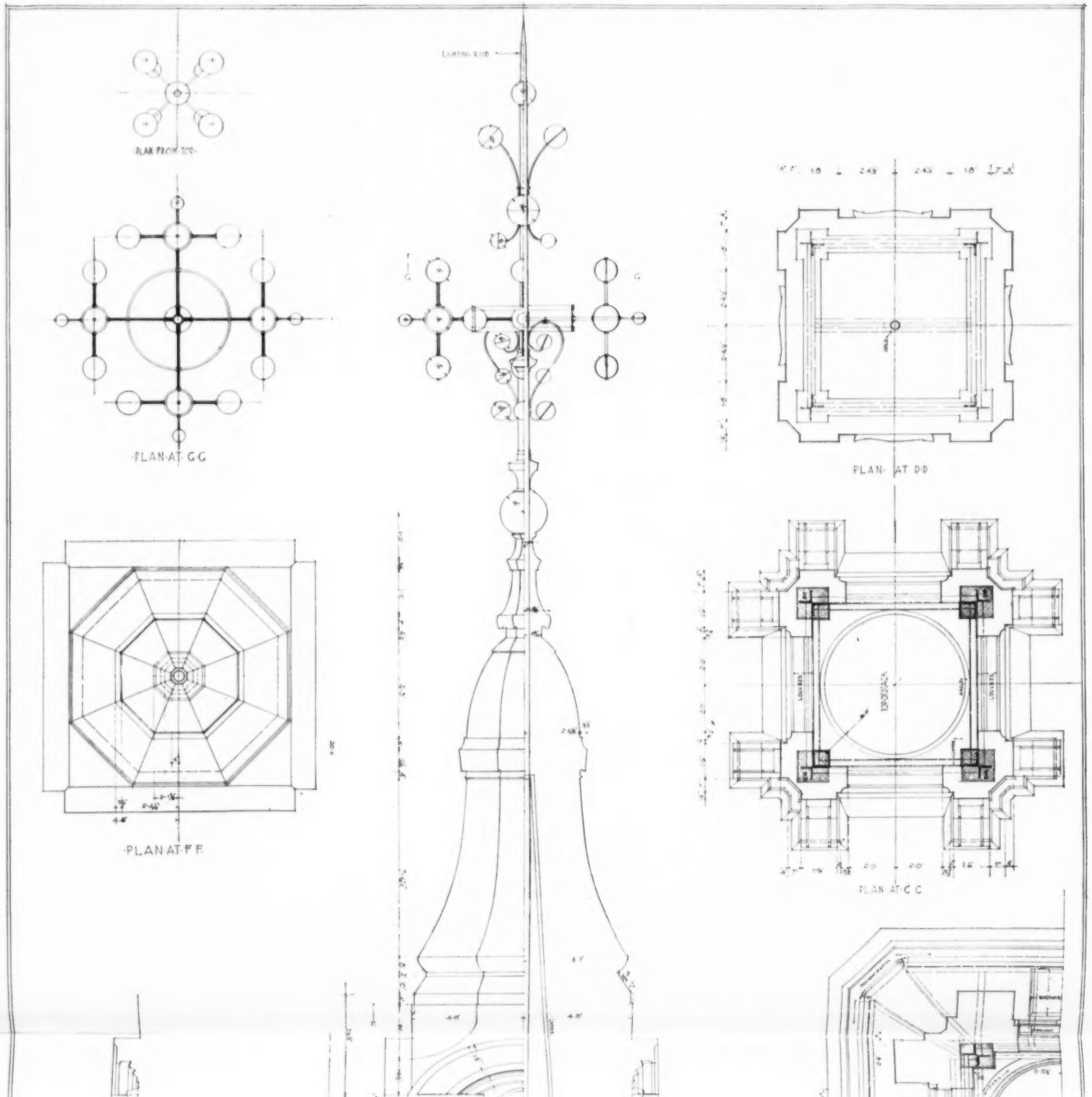


PLATE 71

DETAIL OF ALLEY AND COURT, WITH ELEVATION OF PYRAMID

TOWER EXTENSION, THE TRAVELERS' INSURANCE CO., HARTFORD, CONN.

DONN BARBER, *ARCHITECT*


PLAN AT GG
PLAN AT DD
PLAN AT FF
PLAN AT CC

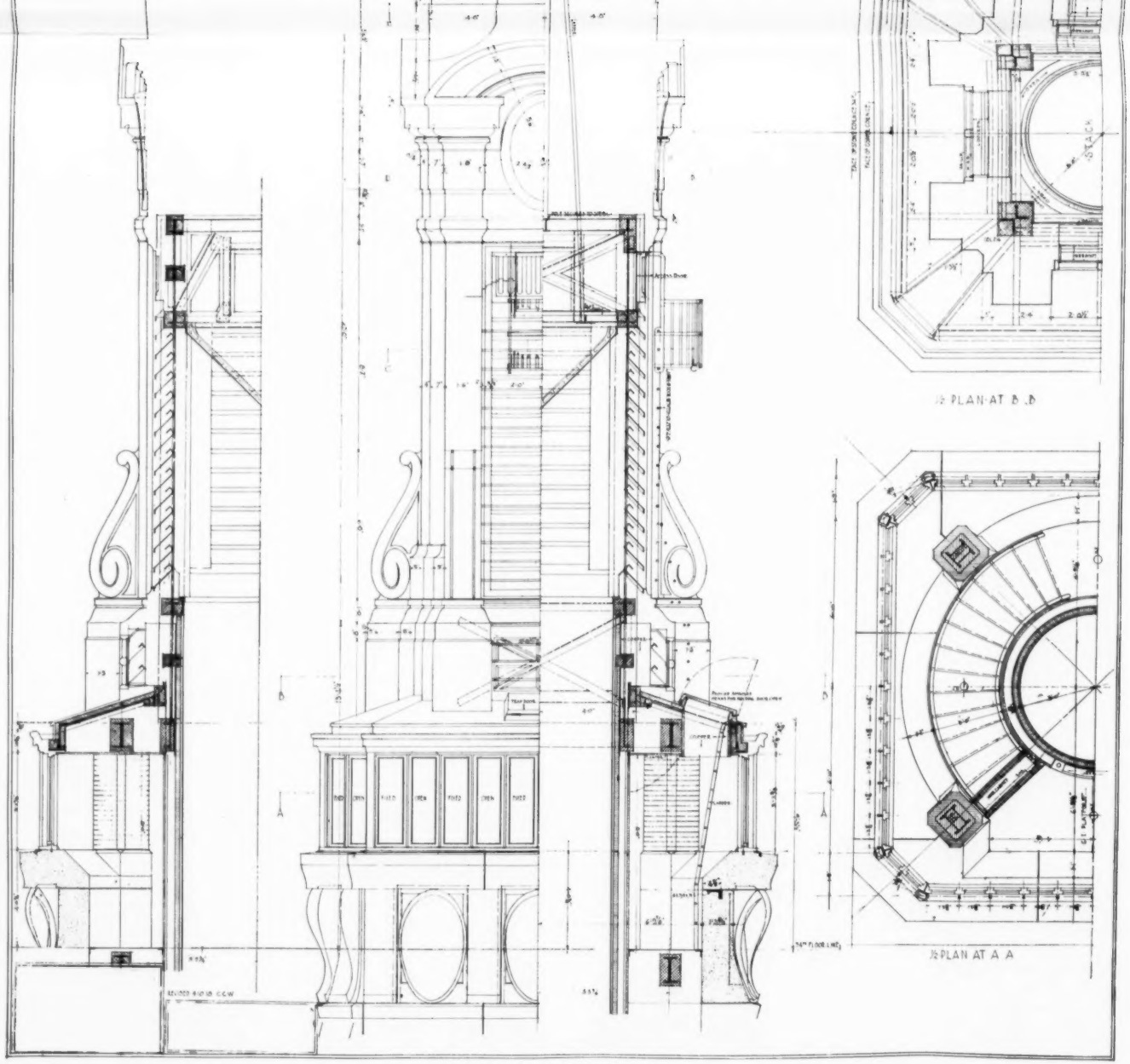


PLATE 72

METAL TOP AND LANTERN

TOWER OF THE TRAVELERS' INSURANCE CO., HARTFORD, CONN.

DONN BARBER, *ARCHITECT*

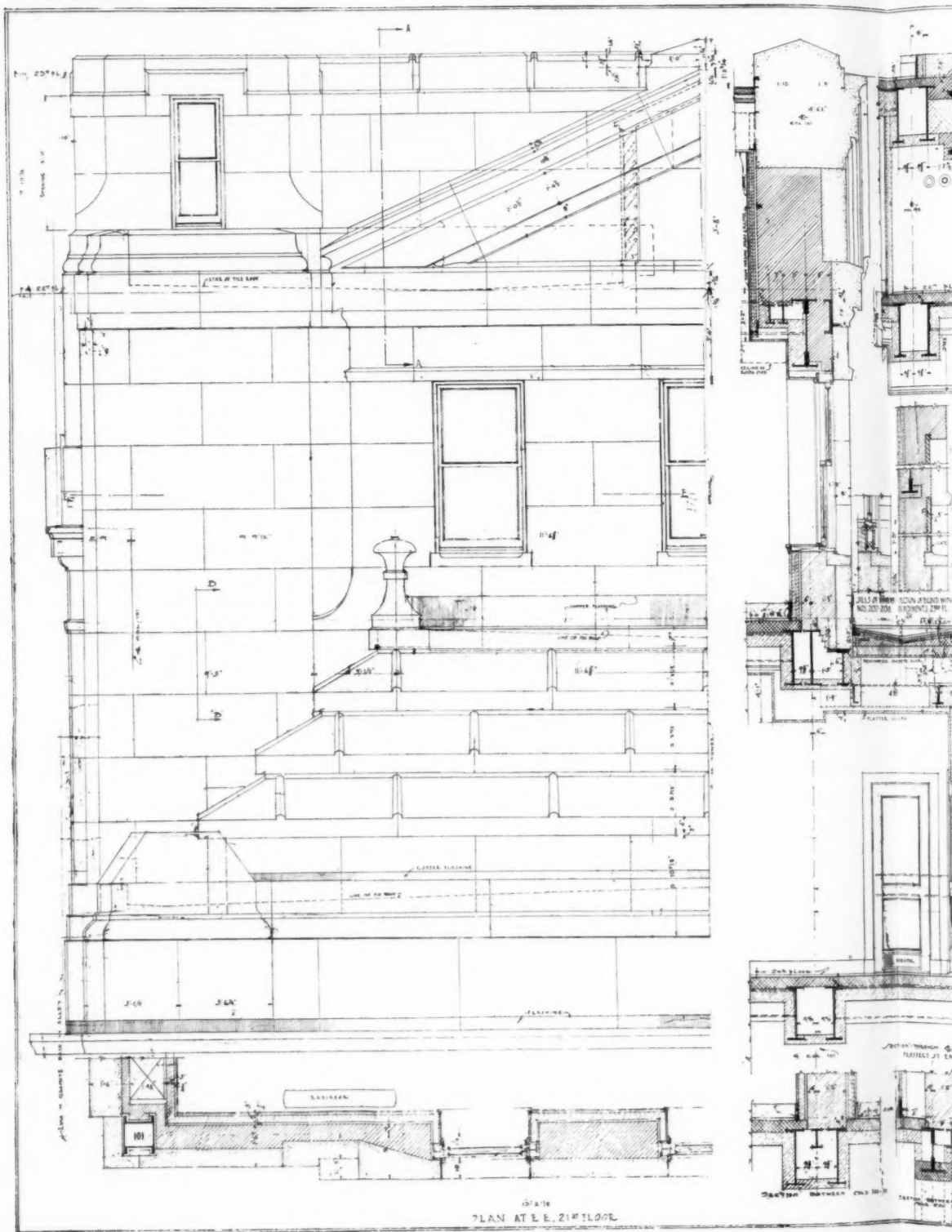
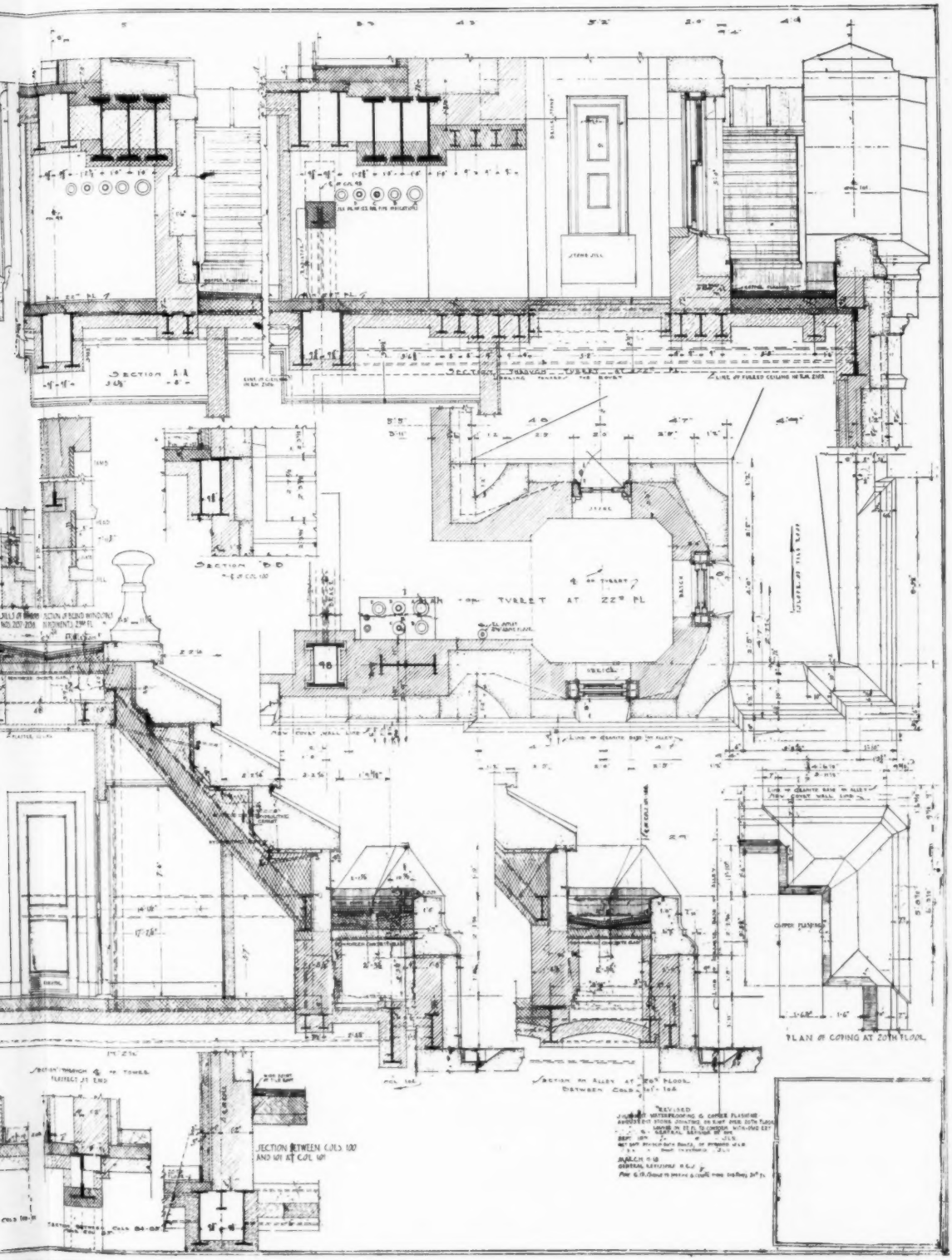


PLATE 73

ELEVATIONS AND SECTIONS ON PROSPECT

TOWER OF THE TRAVELERS' INSURA

DONN BARBER, *ARCHIT*



ONS ON PROSPECT AND MAIN STREETS

ERS' INSURANCE CO., HARTFORD, CONN.

BARBER, *ARCHITECT*

Strategic Camouflage

"Camouflage," says a writer in *The Painters' Magazine* of London, "is by no means a newly coined word. It is derived from the French language and it has been said to be a child of Paris' underworld." In the slang of the Apache *camoufle* means candle, while the old French word *camouflet* also means candle. From these we have the newly coined word *camouflage*.

Its derivation and present use do not seem to present a reconcilable deduction. However, we have the word, and it will no doubt be taken up eventually by our lexicographers, as have many other words that first originated as terms of "slang."

The disguisement of things both animate and inanimate as used in war is not, as many believe, a newly discovered method of deceiving the enemy. The endeavor by different governments to supply uniforms to its troops that would cause soldiers when massed to blend into the landscape is not an invention during this war, for, says *The Painters' Magazine:*

> The American khaki, color of earth, dust, and leaves, the German field gray, the French horizon blue, and previously the coloring of the body of the American Indian, and even the bluish gray peculiar to the atmospheric coloring of the south, was reproduced in the Confederate uniforms.
>
> One of the first extensive modern applications of camouflage was made by General Smuts in the Boer War, when all the paraphernalia was painted with colors that harmonized well with their surroundings. In Italy the mountain troops, fighting in the snow, paint themselves white in the daytime, black at night and follow the seasons with daubs of yellow, blue, red and golden tints, as may be necessary to reproduce the color effects of nature acting as background.

If we are to trace the first use by man of the principles of camouflage we shall have to go back to his earliest and most savage periods. The camouflage of nature, that gave birds a plumage that caused them to blend into the landscape, or to animals whose skins were of such color as to make it comparatively easy to hide from any but the keenest vision, is as early as their origin. Nor is camouflage as applied to ships a new method of disguise. It is interesting to learn that in 1902 a patent was issued to two Americans, A. H. Thayer and Jerome Brush.

> The specification mentions that the reason any object is easily seen, no matter what color it is painted, is because when near enough to be distinguished its various surfaces reflect respectively different amounts of light; the upward surfaces being the lightest, the vertical surfaces less light, the surfaces facing downward less and the deep shadows still less. When far away, so that its various surfaces blend into one, a ship may be visible, owing to the contrast of the whole object with the surrounding sky and water. A white ship may be seen against so bright a sky as to look almost like a black one. Therefore, it makes little difference what color a ship is painted, if it be painted with only one color, as either the whole ship will silhouette against the sky beyond or its different parts will present a strong contrast of light and shade. In short, the process means painting normally light surfaces dark, darkened surfaces light, and coloring the shaded portions with paint that would neutralize and blur the definition of the ship.

These specifications cover the basic method employed by the governments of the Allies in their camouflage operations to-day.

The importance of camouflage is now so thoroughly realized and its value as a strategic method so generally conceded that the Government of the United States has secured the services of men who are developing camouflage to a possibility that elevates it to a position among the arts. At our entry into the war many architects were attracted to this branch of service, and the value of their work has been so thoroughly recognized as to warrant the Government in creating a special department of camouflage.

To this service, not only architects of renown, but many artist-painters, who are prominent among the members of the National Academy of Design, were drawn. Just what has been thus far accomplished can be no better judged by the civilian observer than to attempt to trace the outlines of one of our large battleships or a fleet of transports anchored in New York Harbor on a day of "low visibility." The disguise is so complete that the eye becomes confused and almost useless.

A Rivetless Ship Launched in England

Consul General Skinner, London, in a report to this Government printed in a recent consular report gives the following interesting details of the construction and first launching in England of a rivetless steel vessel.

The report states:

> Instead of riveting and calking the plates, they are joined together in one process by electric welding. This means that the plates are held together temporarily by bolts, and that the joint is then submitted to local heat by means of an electric arc, so that the two plates are fused together. Though the process itself is not new, as certain auxiliary work on ships has been done by electric welding in the past, considerable developments have been made in the last twelve months, and this is the first time that a vessel has been produced entirely by the new method. Its general adoption would speed up production, more particularly in the assembly of bulkhead dock structures, fittings and other interior work. It is computed from the results obtained on this experimental vessel and other Admiralty work that a saving of 20 per cent or possibly 25 per cent could be effected in both time and material.
>
> The United States Shipping Board have been in close touch with this experimental work, with the result that

arrangements are in hand for the manufacture of a number of 10,000-ton standard ships, in the production of which "riveters" will become "welders." While the first vessel just launched is rivetless, it is calculated that these large vessels will only have about 2½ per cent of the originally intended number of rivets. It is seen, therefore, that in nearly all circumstances the electric welding process can be satisfactorily used. In the vessel just launched the "shell" up to and including the bottom seam of the bilge plate is continuously welded inside and out. The cross seams are similarly treated. The outside is continuously welded and the inside "tack" welded. "Tack" welding means welding a short section, say, 3 in., and then skipping another section of about twice as much. The frames, floors, deck brackets and nonwater-tight bulkheads are all "tack" welded; the water-tight bulkheads are continuously welded. In the case of the deck plates, "butt" welding (i. e., the plates arranged end to end, without any overlap) has been adopted. In the construction outlined it is considered that a good margin of safety has been allowed.

The Relation of Capital to Labor

John D. Rockefeller, Jr., in an address delivered before the Chautauqua Assembly at Chautauqua, N. Y., said:

"In modern industry the owner of earlier days has been replaced by thousands of stockholders, for no one man can provide the capital necessary for the great industries of to-day. Instead of a few employees, the workers are numbered by the thousands, tens of thousands and sometimes hundreds of thousands. They come from all sections of the country and often represent many parts of the globe. Instead of one plant there are frequently many plants, scattered all over the country; sometimes they are in foreign countries.

"The result is that contact between owners and employees is practically impossible and too frequently a chasm opens between them. Instead of brotherhood there has developed distrust, bitterness, the strike and the lockout. Often, therefore, the conclusion is reached that labor and capital are enemies; that their interests are antagonistic; that each must arm itself to wrest from the other its share of the product of their common toil.

"This conclusion is false. It is based on abnormal conditions. Labor and capital are partners; their interests are common interests; neither can get on without the other. Labor must look to capital to supply the tools, machinery and working capital, without which it cannot make its vital contribution to industry, and capital is equally powerless to turn a wheel in industry without labor.

"Neither can attain the fullest permanent measure of success unless the other does also, and the abnormal conditions, namely, the absence of contact between owner and employee, must be corrected by the re-establishment of personal relations between owners, represented by the officers, and employees, represented by certain of their fellow workers in the same plant, whom they themselves have duly elected.

"I am profoundly convinced that nothing will go so far toward establishing brotherhood in industry and insuring industrial peace, both during the war and afterward, as the general and early adoption of this principle of representation by industry, the favorable consideration of which cannot be too strongly urged upon leaders in industry."

Why Manufacturers Build Homes

There is at present among the large group of manufacturing interests planning industrial housing schemes, a very strong tendency to omit the "community" or tenement house and confine these operations to well planned group houses. For these, the better class of labor has strongly indicated its preference by showing a disposition to avoid the tenement when choice was possible.

C. Stanley Taylor, author of the article on the Bristol, Pa., housing scheme, in our special Industrial Housing issue, commenting on the result of a very careful observation from the sociological angle of Government housing in the Middle West, sets forth in a recently published article an account of an interview with the general manager of a large munition plant, who is quoted as stating:

"The best mechanics who come here for jobs are married men who journey from distant towns and cities, attracted by the wage scale. They leave their families behind while they come to 'try out' the place. They are most usually good workmen. After finding a room for temporary quarters, they look around for a house to rent. There are none. The man likes his job. He likes us. But he computes the additional cost of living apart from his family, so he goes back, or seeks another place where he may find a home. We have lost nine out of every ten married men we have hired during the last year: the reason is simply because they were human and wanted to live 'at home.' They are the best kind, the home-loving, steady-going, dependable workmen. We had to have them. That's why we build homes!"

To Build Six Hospitals at Vancouver Barracks

Six additional hospital buildings will be erected at Vancouver Barracks, Oregon, at an estimated cost of $74,000. Of these three will be contagious wards. The work will be done at once under the supervision of the Construction Division of the Army.

Americanization—What It Means

An Americanization Registration Card has been mailed by the Committee on Public Information to industrial plants employing foreign-born workmen and to other agencies reaching foreign language peoples in the United States. It defines Americanization as:

The use of a common language for the entire nation.

The desire of all peoples in America to unite in a common citizenship under one flag.

The combating of anti-American propaganda, activities and schemes, and the stamping out of sedition and disloyalty wherever found.

The interpretation of American ideals, traditions, standards and institutions to foreign-born peoples.

The elimination of causes of disorder and unrest, which make fruitful soil for the propaganda of enemies of America.

The abolition of racial prejudices, barriers, and discriminations, and of immigrant colonies and sections, which keep peoples in America apart.

The maintenance of an American standard of living through the proper use of American foods, care of children, and new world homes.

The discontinuance of discriminations in the housing, care, protection and treatment of aliens.

The telling of the foreign-born why America is at war and why we must all stand together to win it.

The creation of an understanding of and love for America, and of the desire of immigrants to remain in America, to have a home here and to support American institutions and laws.

Price of Copper is Established

The President has approved an agreement, made between the producers of copper and the price-fixing committee of the War Industries Board (after investigation by this committee in conjunction with the Federal Trade Commission as to cost of production), that the maximum price of copper shall be 26 cents per pound, subject to revision after November 1, 1918, f.o.b.

Four conditions are laid down:

First, that the producers of copper will not reduce the wages now being paid; second, that they will sell to the United States Government, to the public in the United States and to the allied Governments at not above the maximum price; third, that they will take the necessary measures, under the direction of the War Industries Board, in the distribution of copper to prevent it from falling into the hands of speculators, who might increase the price to the public; and fourth, that they will pledge themselves to exert every effort necessary to keep up the production of copper so as to insure an adequate supply so long as the war lasts.

Government Demands on Building Materials

A great many theories are afloat relative to the matter of building needs and building supplies. One theory, recently advanced in the daily press, which shows the elaborate speculation indulged in generally, is quoted in the following paragraphs. The awe-inspiring statistics which are compiled on the strength of an exceedingly nebulous hypothesis might inspire one to mirth were it not for the fact that this careless speculation is likely to be of real injury to building interests.

The statement follows:

One reason why building material prices are being held at high levels and are unmistakably headed for still further advances is the announcement that the housing program, for which $110,000,000 has been appropriated, may reach a billion-dollar scale if housing enthusiasts have their way.

The general stock of basic building materials of all kinds on hand throughout the United States to-day is probably sufficient to construct only about $600,000,000 worth of buildings. The normal volume of construction that building material manufacturers cater to is approximately $1,500,000,000.

From the present stocks on hand the Federal authorities have levied heavy demands, and will continue to do so. The volume of building construction for the country this year will probably not exceed $350,000,000, exclusive of Government building operations.

Including the $110,000,000 represented in the Government housing plan, it would appear as though there was ample supply of material on hand, but when it is recalled that ship construction requires practically the same materials that enter into modern building operations, and that the shipyards are calling for an increasing amount of lumber, steel, clay products, cement, it is rapidly becoming a question of doubt as to how even a $110,000,000 housing program can be supplied with building materials, much less a $1,000,000,000 or even a $500,000,000 program, unless the manufacturers of these commodities are permitted to produce them at a rate decidedly greater than that now prevailing. If this permission is much longer deferred price reaction will be postponed until far into the future.

This uncertainty as to what the Federal housing bureaus are going to need in the way of building materials is the main cause of present high prices,

and is the direct cause of the sharp advance in quotations recently reported, and which are yet to come.

There is, however, evidence that Federal authorities are recognizing this condition of affairs because of the recent action in giving priority to Portland cement, certain clay products, and the latest, hollow tile for certain purposes.

A British Viewpoint of Advertising

The editor of *The Architects' and Builders' Journal* of London, in a lengthy review of an editorial in THE AMERICAN ARCHITECT, commenting on the question of advertising by architects, discusses the subject with clarity of vision and shows a practical attitude toward this much-debated matter.

The article expresses the opinion that architecture in England, as in this country, has been too much neglected on its business side, and that the inevitable result has been reached. This condition extends to the placing of the architect, by his own acts or through failure to act, among the ranks of impractical men, who incessantly talk of art which, the editor states, in England "bears the same relation to business as poetry to pork packing."

The remedy for this major evil is to be found, it is stated, in a brisk advertising campaign by architects, a campaign that would at once sweep aside all erroneous impressions.

The editor asks, "Will he do that in America?" and answers his own question by stating that it is doubtful if he will. He further asks, "Having asserted his right, will the architect in America exercise that right?"

Continuing, the article states:

> Just what he will do, and particularly how he will do it, will be watched with interest from this side of the sea, where, unfortunately, ideas are much less democratic.
>
> In the United States, it must be remembered, advertising is held in much higher esteem, and is practised much more vigorously and voluminously than it is in this country. Hence the American laity, instead of being scandalized at the action of their architects, are far more likely to express astonishment and contempt for the fatuity of neglecting so valuable a means of prosperity. Whether our own architects will have the courage to follow American example immediately it would be rash to conjecture; but to assume that they will do it sooner or later is merely to base probability on knowledge of the natural or unnatural history of fetishism—for sooner or later the idolatry ceases. At any rate, to have to maintain compulsorily this supposed gentility of not advertising is rather a farcical situation. There can be but little virtue in enforced abstention. Why not set the members free to do as they like about it? To allow this liberty would be to remove an undeserved slur on advertising. To advertise is not necessarily to be blatant and vulgar. Not the fact of advertising, but the method of doing it, is the criterion of vulgarity, and surely architects, of all men, can be trusted not to overstep the bounds of good taste. In America, again, building contractors advertise profusely, but without blatancy. In our own country similar firms seem to have become aware but recently of the advantages of publicity, which, in one form or another, is a condition of prosperity. Why it should be regarded as beneath one's dignity to make known in a modest way and through a respectable medium one's address and business or profession, is a psychological problem that does not admit of easy solution.

Plan for the Rebuilding of Saloniki

Consul General Horton, at Saloniki, Greece, in a recent report to the Department of State, writes: On July 11, 1918, the principal military authorities, the consular corps and others were invited to the Government Building by the Greek Governor General of Macedonia to examine the plans for the rebuilding of Saloniki, which have been prepared by various French architects.

The burned area is about 1,100,000 square meters in extent, and, besides banks, warehouses, hotels and office buildings, was covered with the residences of about 60,000 people. Only the blackened walls were left standing, and in many cases these have fallen.

If the city is to be rebuilt on the new proposed plan, which includes the making of new streets, it will be necessary for the Government to obtain possession of the burned tract by expropriation and to resell it to possible purchasers. A new and abundant water supply system, sewers, electric installations, etc., must be arranged for. The question of capitalizing this big venture must also be taken into consideration. If the work is seriously started there will be a great demand for all kinds of building and other materials, and doubtless foreign companies and business houses will be called upon to make bids. The old Byzantine monuments of the city, such as churches, etc., some of which are of great historical interest and which are especially marked on the plan, will be left intact and measures taken for their preservation.

The plan includes the building of a university and other seats of learning, recreation parks and a long walk and drive on the sea front.

Copies of the plan are not obtainable at present. On account of the present difficulties of transportation and the lack of materials and labor it does not seem possible to begin operations until the conclusion of the war.

The Nation's Borrowings

Between the declaration of war and the end of June, 1918, states *The Nation's Business*, our Government obtained $9,258,144,000 by the sale of bonds, war-savings stamps and thrift stamps. This made our total outstanding long-time, interest-bearing obligations about $10,000,000,000. In other words, in our first year of war our public debt had

increased approximately $9,000,000,000. In four years of war England's debt has risen by about $25,00,000,000; England's expenditures for war to August are estimated at $36,000,000,000.

In preparation for our fourth bond issue, in October, the fourth bond act has just been enacted. There is nothing in the new law to indicate any departure from the general plan which has become familiar in the earlier issues. In other words, the Government will continue to anticipate the proceeds of bonds and taxes by selling short-time certificates of indebtedness and periodically offering bonds for relatively long terms.

As yet our sales of savings stamps do not approach the sales in England. There over $1,200,000,000 have been placed. To the end of June, however, we had only $307,000,000 to show.

Unemployment After the War

Hornell Hart, Research Fellow of the Helen S. Trounstine Foundation on Fluctuations in Unemployment in Cities of the United States, 1902 to 1917, in an analysis of the probable conditions as affecting labor after the war, writes:

The course of employment during the next few months and years cannot, of course, be accurately predicted in the present state of social statistics. Certain factors appear, however, to indicate that the peace industries of the country are likely to go through a depression in the near future. Past oscillations in employment show that a heavy demand for labor is usually followed by a marked slackening. Building permits usually decrease in the year preceding a depression. In 1917 building permits fell off in value in spite of a 20 per cent increase in the cost of building. On the other hand, the total value of contracts let, including Government work, increased, indicating that war demands were filling up a slump in normal requirements. Orders for freight cars usually fall off just before years of depression. These orders in 1917 were only half what they were in 1916.

If peace should come this year the war activities which are now taking place of declining normal business would largely cease. A million and a half soldiers and sailors would be returned to urban occupations. Unless European countries were ready immediately with huge orders for rehabilitation work, or unless active preventive steps were taken, demobilization would in all probability accentuate the depression which is now due, and throw the country into a condition where our returning defenders would be left to hunt fruitlessly for work in a glutted labor market.

If the war should go on, say for two years or more, the probabilities are harder to foresee. Whether normal business would recover sufficiently to take over the war workers cannot be determined without further observation and research.

The facts outlined above shed light on some of the remedies proposed for unemployment, as for example: industrial education. "Unemployability" has been announced as a leading cause of unemployment. Our facts show that 4,000,000 workers who were employed in September, 1907, were unemployed in January, 1908. If these had been unemployables, they would not have been working at the earlier date.

Regularization of industries is a valuable remedy for seasonal fluctuations. The development of winter construction work, the reduction of coal prices in the spring, and the filling of stock orders in dull seasons are hopeful moves.

If all employment could be handled through one system of offices, valuable data on unemployment could be secured. In order to achieve the full possibilities of such clearing houses, the employment business should be made a Government monopoly, and employers should be persuaded or required to register all vacancies with the public employment exchanges. It must be remembered, however, that employment offices do not create a demand for labor, and that the fraction of the total unemployment which such agencies could eliminate is therefore relatively small.

Washington, D. C., Housing Operations

Contract has been awarded for the construction of residence halls which are to be erected on the Union Station plaza, Washington, D. C., under the direction of the Bureau of Industrial Housing and Transportation. The award was made as a result of competitive bids, which will reduce the cost of the development to an absolute minimum. The estimated time of completion is three and one-half months.

This project, constituting the first of the units to be erected in Washington by the Bureau of Industrial Housing and Transportation for the accommodation of war workers, is designed to provide quarters for 2000 persons.

For the information of persons who are desirous of reserving accommodations in these residence halls, the bureau wishes to state that no accommodations are being set aside for the present. As soon as the buildings are approaching completion, the matter of reservations will be taken up.

An American Gun Plant in France

To obviate the necessity of sending service worn big guns to the United States for repairs, it has been decided by the War Department to build in France a relining plant at a cost of from $25,000,000 to $50,000,000. It is said that engineering work for the great project which will compare in size to the Krupp works at Essen, Germany, were completed, and orders for equipment actually issued within thirty days after conception of the plan by the Ordnance officers.

Architects and Engineers for U. S. Housing Contracts

The Bureau of Industrial Housing and Transportation announces the following appointments in connection with projected housing developments:

Staten Island, N. Y.—Architects, Delano & Aldrich, New York; town planner, A. F. Brinkerhoff, New York; engineer, C. S. Pollock, New York.

Florence, Ala., Sheffield, Ala., and Tuscumbia, Ala.—Architects, Warren & Knight, Birmingham, Ala.; town planner, Harold A. Caparn, New York; engineer, Julian Kendrick, Birmingham, Ala.

New Air Service Field Opened at Jackson, S. C.

Emerson Field, a new Air Service flying field at Jackson, S. C., was opened on Aug. 1. It is named in memory of Lieut. William Emerson, Field Artillery, who was the first Artillery officer killed while serving with an American aero squadron at the front.

The field, which was authorized on May 2, is to operate in conjunction with artillery, and for this purpose includes both airplanes and balloons.

At present there are about 450 officers, including pilots, and 350 men stationed at Emerson Field.

New Field Artillery Center to Cost Nearly $4,000,000

Work has just begun by the Construction Division of the Army on the new Field Artillery Training Center at West Point, Ky., near Louisville. The estimated cost for the land and the buildings, including a 500 bed hospital and a 500 horse veterinary hospital, is $3,721,000.

The tract of land is approximately 20,000 acres and was purchased for $500,000.

Work will be pushed so as to make the camp available as soon as possible.

Fuel Administration Warns of Coal Shortage

The Fuel Administration announces that the demand for fuel on the part of the war-making branches of the Government and the war industries is growing by leaps and bounds. Every increase in the war-making efficiency of the nation is forcing a corresponding increase in the fuel demand. Estimates of the coal consumption for the year, which were judged high in April, are now proving inadequate.

It becomes increasingly apparent that the strictest fuel economy must be enforced if the country is to escape a serious coal shortage next winter. Every means of coal conservation must be observed, and every wasteful and unnecessary use of coal must be eliminated.

Another Training School for U. S. Balloon Pilots

Secretary Daniels announces that the Navy contemplates establishing an additional training school for balloon pilots. This school will probably be located at some point east of the Mississippi and south of the Ohio River, and it is hoped that suitable quarters for the personnel can be secured at some school, university or country club.

In addition to available buildings, a field will be necessary to carry on the outdoor work. It is also essential that there be good transportation facilities at the point selected.

Group Style Houses Favored in Bridgeport Housing Development

Over 50 per cent of the houses to be built in Bridgeport, Conn., with the $3,000,000 federal loan, says the *Telegram* of that city, will be of the group house style, eighteen apartments to the house. There will be very few single houses built with this Government loan, but arrangements are being made for a number of two-family houses, some to be built of brick and others of wood. One of the requirements for all of these houses is that they have plenty of light and room for garden space.

Better Homes for Farm Labor

A special bulletin issued by the Department of Agriculture, Washington, entitled "Supplying the Farm Labor Needs," contains this paragraph: "There is at this time a need for a larger number of comfortable homes for the tenants and hired help

on the farms. The old shack which was simply a place in which to exist will no longer satisfy the workers. For the appearance of the farm and the beautification of the country, suitable, comfortable homes should be built and maintained. The building of houses for the help will allow many farmers, instead of moving to town, to remain in their own homes on the farms, where they can render the greatest assistance to the community and to agriculture."

Building Operations in 1917

The building operations in the larger cities of the country were much less in 1917 than in 1916, according to the United States Geological Survey. In sixty selected cities 199,738 permits were issued or buildings erected in 1917, a decrease of 70,044. The cost of these operations was $584,193,378 in 1917, as against $899,684,512 in 1916, a decrease of $315,491,134, or 35 per cent. The building operations in Greater New York cost $90,221,357, in Chicago $49,167,990, in Detroit $39,666,800, in Philadelphia $33,050,220 and in Cleveland $30,483,750.

Of the sixty cities selected forty-eight showed decrease and twelve showed increase. The decrease in Greater New York was $109,010,819, or 55 per cent; in Chicago, $63,667,160, or 56 per cent; in Detroit, $11,401,510, or 22 per cent; and in Philadelphia, $16,269,005, or 33 per cent. Waterbury, Conn., where the building operations cost $6,562,930, showed the largest increase—$2,292,930, or 54 per cent. The other cities that showed increase were Akron, Atlanta, Chester, Denver, El Paso, Hartford, Los Angeles, New Haven, Omaha, Sioux City and Youngstown. Various reasons are given for these changes. The principal causes of decrease were the scarcity and high cost of material and labor. In some cities the cause of decrease was financial stringency. The causes of increase were local. In New Haven, for example, a great increase was caused by the erection of a large building for Yale University.

For 1917 a total of 145 cities reported operations costing $687,415,605. For 1916 practically the same cities reported operations costing $1,024,211,675. Of the 145 cities reporting for 1917, 129 stated operations by classes of structures. The total cost of the buildings erected in them was $632,694,952. The part of this amount expended on wooden buildings was $168,290,958, or 27 per cent; on brick or hollow-tile buildings $322,147,677, or 51 per cent; on stone buildings, $4,589,168, or less than 1 per cent; on concrete buildings, $66,511,300, or 11 per cent; and on steel skeleton buildings $58,440,361, or 9 per cent.

Walnut Trees on Lincoln Highway

The planting of black walnut trees along the Lincoln Highway route in Iowa has been urged by the Good Roads Bureau of the Cedar Rapids Chamber of Commerce. The trees, it is pointed out, are used by the Government in the making of gun stocks; they grow rapidly, are beautiful, and the nuts have a wide demand. Planted on both sides of the highway 100 feet apart, 106 trees would be needed for each mile. The Lincoln Highway is approximately 350 miles in extent across Iowa. If the walnut planting idea is carried out 31,100 trees will be planted in the State.

Appropriation for Women's Boarding Houses in Washington

Out of the $10,000,000 appropriated by Congress for housing clerks in the executive departments and workmen in the navy yard at Washington, an allotment of $25,000 has been made to assist women in establishing boarding houses in the district.

Plainfield, N. J., Housing Needs Becoming Acute

The borough council at Plainfield, N. J., has appointed a committee to consider the housing situation, which is serious. What to do with the increasing number of workmen drawn to that locality by the completion of new plants is the problem. Hopes of Government co-operation are entertained by the committee.

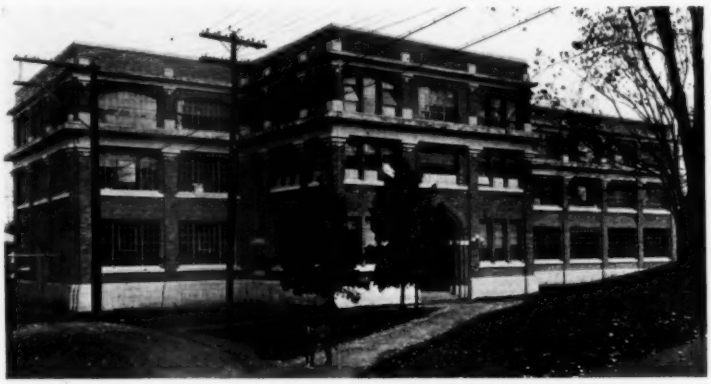
Rebuilding Halifax, N. S.

The rebuilding and extension of the city of Halifax since the explosion of last December is now progressing rapidly. The completeness of the obliteration of that part of the city worst affected by the explosion makes simpler its replanning on modern lines. Main arteries of traffic will be widened to 80 ft., and some of the side streets will be narrowed to 40 ft. A park will be laid out, and the new buildings will be of a better type.

Oil Storage Tanks and Reservoirs

A very interesting bulletin has been issued by the Bureau of Mines, covering metal and concrete reservoirs and giving drawings and other illustrations of the same, losses in storage, etc. Copies may be had of the Government Printing Office by sending 25 cents for Bureau of Mines Bulletin 155.

Department of Architectural Engineering



RAND HALL,
CORNELL
UNIVERSITY

GIBBS & WOLTZ
ARCHITECTS

Light in the School House

In Two Parts—Part II.

TO design the artificial lighting of a school room, the chief factors are the floor area, the total luminous flux emitted per lamp and a co-efficient of utilization. The flux is measured in lumens. A lumen is the unit of light flux and is the quantity of light required to illuminate one square foot of area to an average intensity of one foot candle. The light-emitting power of the various kinds of lamps can be obtained from data books supplied by the manufacturers of lamps. By the coefficient of illumination is meant the proportion of the total light flux emitted by the lamps, which is effective on the work plane. The effective light is affected by the color of the walls and ceiling, the size of the room, the type of reflector and the system of lighting.

In the accompanying table approximate coefficients of utilization for modern lighting equipment are given. The work plane in this case is a horizontal plane 30 inches above the floor. These values refer to the initial installation without any allowance for depreciation. Depreciation is not measured in this code, but on page 60, THE AMERICAN ARCHITECT of July 10, 1918, will be found a discussion of this point, in which a depreciation factor of 1.20 to 1.40 is recommended for factory lighting. The principal cause of depreciation is the accumulation of dust, which varies in factories with the class of work carried on and, of course, with the maintenance care in the way of cleaning the lamps and fixtures. It may be well to use a depreciation factor of 1.20 for school houses. Further data concerning coefficients of utilization are found on pages 875-6, THE AMERICAN ARCHITECT of June 26th, 1918, and which may well be studied in connection with those here given.

For determining approximately the size and number of lamps to be used in a given room by means of the coefficients of utilization given in the table, it is necessary to know the luminous output

in lumens per watt for the electric lamps considered or in lumens per cubic foot of gas consumed per hour if gas lamps are considered. At the present time (1917) the light output of tungsten filament electric incandescent lamps, based on average service conditions of regularly maintained installations, ranges from 8 lumens per watt for the smaller vacuum tungsten lamps to 14 lumens per watt for the larger gas-filled tungsten lamps employed in school lighting. For incandescent gas systems similar service values range from 150 to 250 lumens per cubic foot of artificial gas consumed per hour. The computation for the total lumens required to give a certain illumination intensity in foot-candles is as follows:

OAKLAND POLYTECHNIC HIGH SCHOOL
JOHN J. DONOVAN, *ARCHITECT*
A strictly utilitarian building without architectural treatment, with a maximum of daylight provided as for an industrial building

a = area of floor or horizontal work plane, in square feet.
i = illumination intensity in foot candles.
l = lumens output per lamp.
n = number of lamps.
u = coefficient of utilization.
d = depreciation factor, 1.20 to 1.40.

To determine the illuminating intensity in foot candles for a given number of lamps we have:

$$i = \frac{n\,l\,u}{a} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

If the size of the lamps is to be determined the computation is made thus:

$$l = \frac{i\,a}{n\,u} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

If the depreciation factor is introduced equation (1) becomes:

$$i = \frac{n\,l\,u}{a\,d} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

and equation (2) becomes:

$$l = \frac{i\,d\,a}{n\,u} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4)$$

The illumination intensity on the horizontal work plane should be as uniform as possible. The variation should not be greater than 4 to 1. This ratio refers to the light received by the object illuminated and should not be confused with the ratio of 20 to 1 for brightness contrast given elsewhere, which refers to the light radiated by the object. For example, a blackboard and a white sheet of paper on it may receive the same amount of light, but the latter will reflect much more light than the former, thus causing a marked brightness contrast between the two surfaces.

APPROXIMATE COEFFICIENTS OF UTILIZATION—MODERN LIGHTING EQUIPMENT

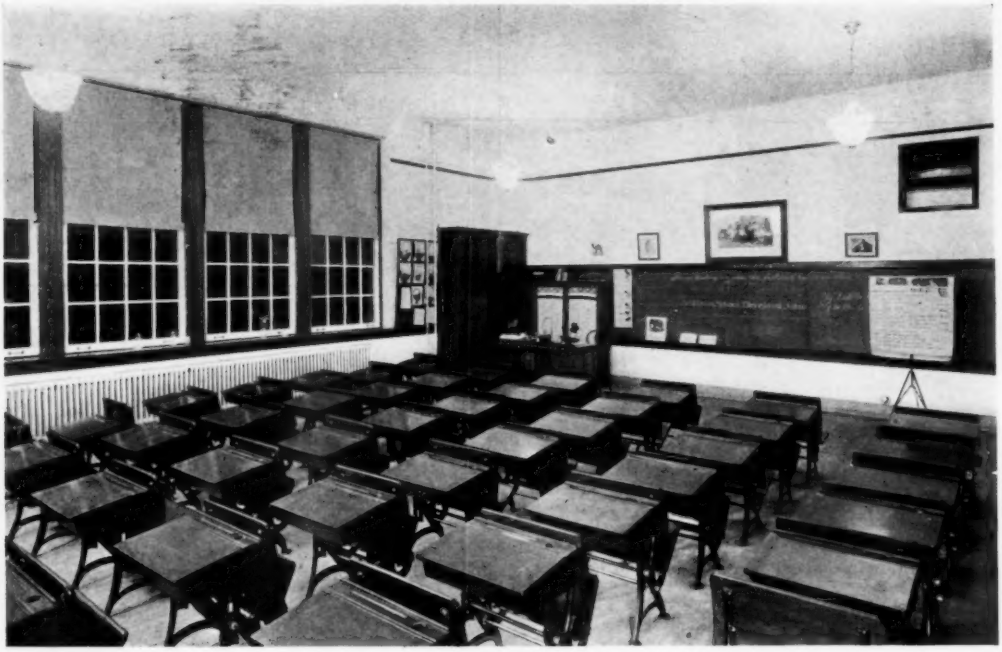
	Light color walls, Light color ceiling	Medium color walls, Light color ceiling
Small Rooms (Offices, Corridors, etc.)		
Direct lighting; dense glass (open bottom reflectors)	0.40	0.35
Semi-indirect lighting; dense glass	0.25	0.22
Indirect lighting	0.23	0.20
Medium Sized Rooms (Class Rooms, Laboratories, etc.)		
Direct lighting; dense glass (open bottom reflectors)	0.50	0.45
Semi-indirect lighting; dense glass	0.35	0.30
Indirect lighting	0.30	0.25
Large Rooms (Auditoriums, etc.)		
Direct lighting; dense glass (open bottom reflectors)	0.62	0.60
Semi-indirect lighting; dense glass	0.43	0.40
Indirect lighting	0.40	0.38

Systems of lighting are usually divided into three classes, namely: direct, semi-indirect and indirect. This is arbitrary and the boundry lines are quite indefinite.

A direct lighting system is known as one in which most of the light reaches the work plane directly from the lighting unit including the accessory which may be an opaque or glass reflector or a totally enclosing transparent or translucent envelope. Direct lighting systems may be further classified as *localized* and *general* or distributing. In the former the units are so placed as to light local work spaces, and in the latter they are well distributed so as to light the whole area more or less uniformly.

A semi-indirect system is known as one in which a portion of the light reaches the work plane directly from the unit and a relatively large portion reaches

the work plane indirectly by reflection from the ceiling and walls. The accessory is usually an inverted diffusing bowl or glass reflector. When this glass has a high transmission factor the lighting effect approaches that of ordinary direct lighting,



ADDISON SCHOOL, CLEVELAND.

W. R. McCORNACK, *ARCHITECT*

An excellent example of artificial lighting accomplished by the use of a direct-indirect system of lighting. Note the even distribution of light and absence of shadows

and when of low transmission, the effect approaches that of indirect lighting.

An indirect system is known as one in which all or practically all the light reaches the work plane indirectly after reflection from the ceiling and walls. The accessory is usually an opaque or slightly translucent inverted bowl or shade containing a reflecting medium.

All three of these systems of lighting are in successful use in schools. There has been a growing preference for semi-indirect and indirect lighting, especially since the introduction of modern lamps of great brilliancy. Local lighting by lamps placed close to the work is unsatisfactory except for special cases such as the lighting of blackboards, maps, charts, etc.

To illustrate by an example, assume a room, whose floor (also work plane) is 30 ft. by 18 ft., to be lighted by a semi-indirect system from six fixtures containing one lamp each. It will also be assumed that the ceiling is highly reflecting, the walls moderately reflecting, and the illumination intensity desired is 5 foot-candles. The luminous output required of each of the six lamps will be found by substituting the assumed values in the equation (2), thus:

$$l = \frac{5 \times 30 \times 18}{6 \times 0.30} = 1500 \text{ lumens}$$

Allowing a depreciation factor of 20 per cent, as representing a well maintained installation, the lumens actually required would be $\frac{1500}{0.8} = 1875$ lumens. Or by equation (4)

$$l = \frac{5 \times 1.2 \times 30 \times 18}{6 \times 0.30} = 1800 \text{ lumens}$$

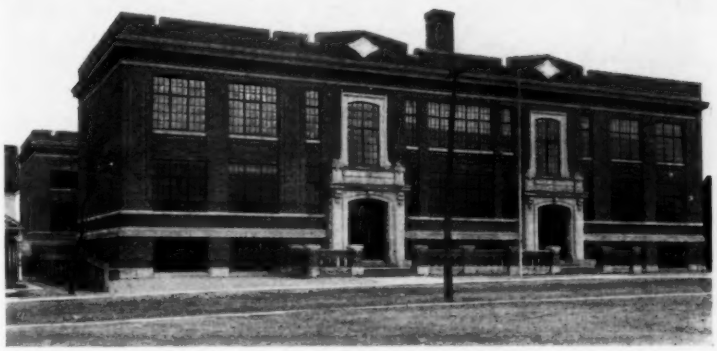
If gas-filled tungsten lamps are considered, whose average output under service conditions is 12 lumens per watt, it is seen that a 150-watt lamp in each fixture will give the desired results.

If gas mantle lamps are considered, whose average output in lumens under service conditions is

250 lumens per cubic foot of gas consumed per hour, it is seen that a lamp consuming 5 cubic feet of artificial gas per hour will be satisfactory in each fixture.

The above example is intended solely to illustrate the method of computation. Estimates of the illumination intensity obtained from an actual installation may also be made by a similar computation.

Suitable switching and controlling arrangements should be made to permit of lighting one or more lamps independently as conditions may require.



WALBRIDGE SCHOOL, TOLEDO.
EDWIN M. GEE, *ARCHITECT*
Well disposed glass areas affording good daylight illumination

The teacher's desk may be illuminated by one of the overhead lighting units, or if necessary, by a desk lamp.

With the usual lighting equipments the distance between the units should not exceed one and one-half times the height of the apparent source of illumination above the working level.

Except in very rare instances bare light sources should not be exposed to view. They should always be adequately shaded or completely hidden. Even when shaded by translucent media, such as dense glassware, the lighting units should be placed well out of the ordinary range of vision; in other words, it is recommended that lighting units be of low brightness* even if they are located high in the field of view.

The maximum brightness contrast of juxtaposed surfaces in the normal visual field should be preferably not greater than 20 to 1; that is to say, the darkest part of the work space observed should have a brightness preferably not less than one-twentieth of that of the brightest part.

Glossy surfaces of paper, woodwork, desk-tops, wall and blackboards are likely to cause eye-strain, because of specular or mirror-like reflection of images of light sources, especially when artificial light is used. Matte or dull finished surfaces are recommended. It is to be noted that a high reflection factor does not necessarily imply a polished or glazed surface.

To minimize eye-strain it is recommended that unglazed paper and large plain type be used in school books.

Children should be taught to hold their books properly, to assume a correct position relative to the light source, and to safeguard their vision.

It has been found in practice that the admixture of daylight and artificial light is not satisfactory unless the latter is derived from lamps designed with special reference to producing daylight color values. Hence in waning daylight it is desirable to shut out the daylight and to use artificial light exclusively.

Blackboards should be a minimum size practicable and should not be placed between windows. Their position should be carefully determined so as to eliminate the glare due to specular reflection of images of either artificial or natural light sources directly into the eyes of occupants of the room. The surface of blackboards should be as dull as possible and this dullness should be maintained.

Glare, due to specular reflection from blackboards, may be reduced or eliminated by lighting them by means of properly placed and well shaded local artificial light sources.

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*Preferably not to exceed 250 millilamberts. A millilambert is equal to 0.002 candles per square inch.

The following table shows the order of magnitude of the brightness of some light sources in common use:

	Approximate brightness Candles per sq. in.
Indirect lighting: ceiling, directly above the lighting unit	0.01 to 0.15
Semi-indirect lighting: heavy density glassware	0.07 to 0.2
Semi-indirect lighting: light density glassware	0.4 to 2.0
Direct lighting: 10 in. (25 cm.) opal glass ball containing 100-watt vacuum tungsten lamp at center	0.5 to 1.0
Direct lighting: vacuum tungsten lamp (frosted) in open bottom reflector	4. to 6.
Vacuum tungsten lamp, filament exposed to view	1,000.
Gas-filled tungsten lamp, filament exposed to view	4,000.
Gas-mantle, bare	30.
Gas-mantle, concealed in 6 in. (15 cm.) opal glass globe	2.
Mercury arc tube (glass)	16.
Daylight: clear blue sky	2.

In Fig. 1 are shown some simple graphical considerations of blackboard lighting. In (*a*) is shown a plan view of a room with windows on one side. Rays of light are indicated by A, B and C in a horizontal projection. These are supposed to come from bright sky. By the application of the simple

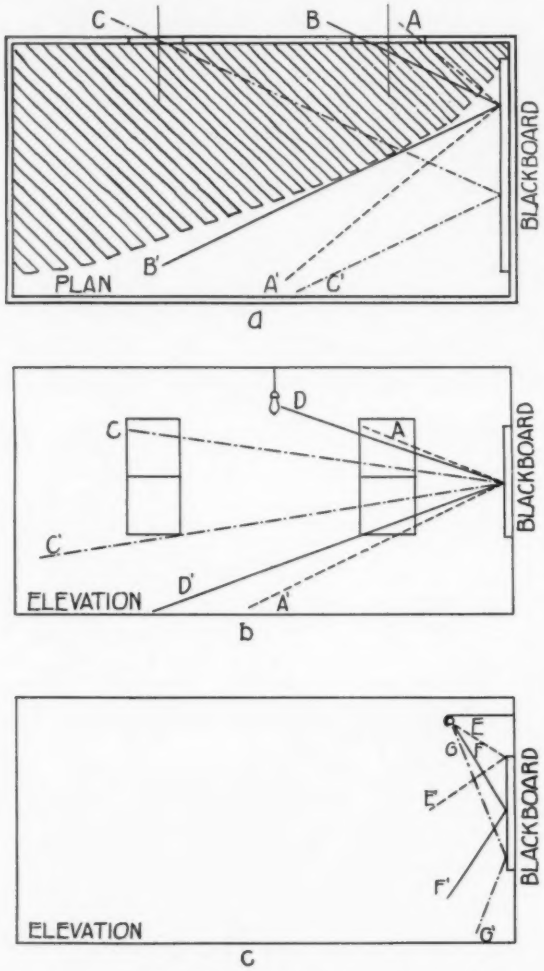

FIG. 1—DIAGRAMMATIC ILLUSTRATION OF GLARE FROM BLACKBOARDS.

(*a*) Showing that occupants of seats in unshaded area are subjected to daylight glare from blackboards.
(*b*) Showing angles at which glare is experienced from daylight and from artificial light.
(*c*) Arrangement of local artificial lighting to minimize glare

optical law of reflection—the angle of incidence is equal to the angle of reflection—it is seen that pupils seated in the unshaded area will experience glare from the blackboards on the front wall. In (*b*) is shown the vertical projection of the foregoing condition. It will be apparent from this graphical illustration that by tilting the blackboard away from the wall at the top edge the pupils in the back part of the room will be freed from the present glaring condition. Whether or not this tilting will remedy

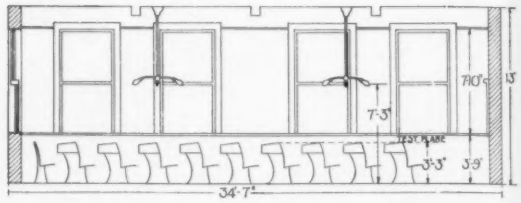

FIG. 2 (*a*).—OLD ARTIFICIAL LIGHTING EQUIPMENT.

bad conditions may be readily determined in a given case. In (*b*) the effect of specular reflection of the image of an artificial light source is shown by D. In (*c*) is shown a proper method of lighting blackboards by means of artificial lighting units.

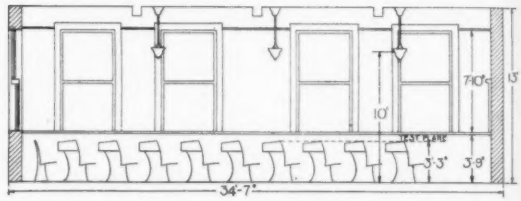

FIG. 2 (*b*).—NEW ARTIFICIAL LIGHTING APPARATUS.

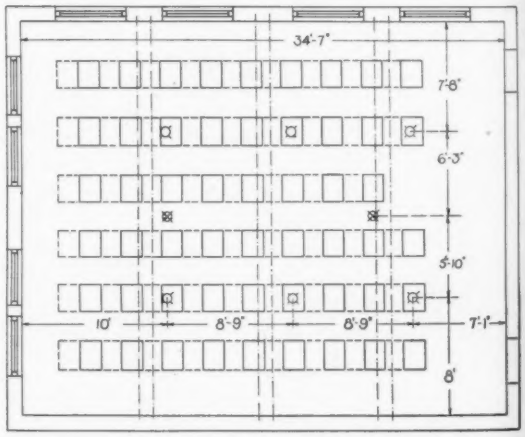

FIG. 2 (*c*)—OLD (Crossed Circle) AND NEW (Pointed Circle) OUTLETS FOR ARTIFICIAL LIGHTING EQUIPMENT IN A CLASS ROOM.

This will often remedy bad daylight conditions whether due to an insufficient illumination intensity of daylight or due to reflected images of a patch of sky.

In order to avoid excessive brightness contrast which is trying to the eyes, blackboards should not be placed on a white or highly reflecting wall.

GARFIELD SCHOOL, TOLEDO.
EDWIN M. GEE, *ARCHITECT*
Window spaces broken by piers, which relieve the purely utilitarian aspect of the building

FRANCES WILLARD SCHOOL, HIGHLAND PARK, MICHIGAN
WELLS D. BUTTERFIELD, *ARCHITECT*
Architectural treatment subordinated to utility, a building providing every requirement of a schoolhouse to which adornment could be added as cost permits

Rehabilitating the lighting of old buildings will be illustrated by an actual case where the artificial lighting of a classroom was made satisfactory at a small expense. In Fig. 2 (*a*) is shown an elevation of a section of the class room showing the old fixtures. In Fig. 2 (*c*) the crossed circles indicate the positions of the two old fixtures in this room. The chief objections to this old system were as follows:

(1) The lighting units were hung too low, so that eye-fatigue resulted from the bright sources in the visual field.

(2) The light sources were not shielded from the pupils' eyes.

RHODE ISLAND SCHOOL OF DESIGN
DAY & KLAUDER, *ARCHITECTS*
An example of daylight interference from adjoining buildings which requires special consideration

(3) Two fixtures are insufficient to provide satisfactory illumination over the entire work plane in a room of the dimensions shown. This unsatisfactory condition was remedied by means of six fixtures placed as indicated by the pointed circles in Fig. 2 (*c*).

These fixtures, shown in elevation in Fig. 2 (*b*), consisted of inverted diffusing glass shades containing one lamp each. The dimensions of the room are shown in the illustration.

A systematic maintenance should be provided in order to insure against depreciation in the illumination intensity due to burned-out lamps, broken gas mantles, discoloration, etc., and to accumulations of dirt upon the lamps and upon the surfaces of the reflecting and transmitting media. It is found in practice that carelessness in this respect may easily reduce the effective illumination by 50 per cent, especially in indirect and semi-indirect lighting.

This code presents the essential requirements, the fulfillment of which will provide adequate lighting conditions. Like all standards, it can be modified in some of its less essential elements. The essentials, such as the direction of light, intensity of illumination at the work and absence of glare must not be deviated from and the maximum requirements or better should be provided.

The providing of adequate light must not be influenced by the cost involved, for a depreciated eye-power, which is becoming more prevalent, is a tax on society that should be avoided. To avoid this tax the initial step must be taken in the school.

It is gratifying to know that one of our national technical societies devotes a large portion of its activities through its special and legislation committees to matters having such important bearing on the welfare of the public. The recommendations of the Illuminating Engineering Society are in every way worthy of consideration and use, and this society keeps step with the progress made in the art of illumination.

Code Comment

COMMENT on the article entitled "An Important Departure in Building Codes," printed in THE AMERICAN ARCHITECT of July 3, 1918, has been made by one of the leading fire prevention engineers of this country. This comment was not made in the form of an article, therefore certain extracts only will be here presented.

The writer is of the firm opinion that it is a wrong principle to apportion stairways and other means of egress of a building solely upon the basis of floor area. The object of a law requiring minimum exit requirements from a building is to furnish safety to human beings who may be present in a building at the time a fire may occur; and while for a certain class of occupancy the floor area may, in general, afford a measure of the number of people who are likely to be assembled upon any particular floor, we all know that there are many exceptions to such a rule. It follows that the only proper way of apportioning exits is by basing them upon the actual occupancy of the building.

Most of the modern building codes contain an occupancy clause which specifies the number of people which may be assembled upon each floor of a completed building. If in the future the character of occupancy should change then the building department should have authority, and it should be its duty to require additional exits in the building if the new occupancy is such as to require them.

Criticism is made that there is no provision for theatres, but it is altogether likely that the Detroit Code will treat of everything pertaining to theatres in a separate section. Under the head of "Location" the proposed code requires that there shall be one stairway on each side of a dividing partition or wall in all buildings of 6000 square feet of floor area. If this would permit one stairway for 5900 square feet of floor area, the writer considers that it would be a dangerous provision. Every floor area where more than 25 people are likely to assemble should certainly have two means of exit.

Attention is also called to the lack of a clear definition of the horizontal exit. The apparent permitting of a distance of 300 feet between exits in buildings supposed to have incombustible contents is a dangerous provision. It is exceedingly rare that there is any type of manufacture where the amount of combustible material is so small as to warrant such a provision as this. This would be true of a warehouse full of stoves or other metal articles, but the criticism is very just as applied to any manufacturing process.

The grading of smoke towers and fire towers is criticised, as those who have given this subject careful study have clearly defined ideas as to what is meant by a smoke-proof tower or a fire-proof tower, which usually means one and the same thing, and it is thought that this method of grading them would be misleading and unfortunate.

The 42-inch width for a stairway is not considered by this writer to be the proper allowance. He states that it has been well established that 44 inches is a minimum width that should be allowed on stairways where two people are supposed to travel abreast each other. A width of 42 inches is recommended in the National Board of Fire Underwriters Building Code, is the law in the New York Building Code and also in the New York State Factory Laws. Various other codes have also adopted the same width.

This difference of two inches might not appear to be vital, and the larger width would certainly add to the safety of the stairway. In either case it is a radical and necessary departure from the old custom of increasing the width of stairways on increments of 6 inches. As stated, a stairway should be built for one, two, four or six persons abreast, as may be necessary, and this would require in the case of the Detroit Code that the width should be a multiple of 21 inches. In no other way can safe stairways be furnished.

The critic disapproves of wired glass and metal construction in stairway enclosures under the certain conditions mentioned in the proposed code. The objection is based upon a free transmission of heat through such material; and it can be readily seen that a fire in contact with such an enclosure in a lower story of a building could transmit enough heat to render difficult the use of this stairway by people descending from floors above. While such a protection would for a period of time obstruct the passage of flame and gas, the transmission of intense heat might be as dangerous to life as these other effects of combustion. Such an enclosure might be acceptable in a building not to exceed three or four stories in height and from which the occupants could escape before enough heat would be generated to be transmitted to any dangerous degree.

A Correction

IN THE AMERICAN ARCHITECT of August 14, 1918, the sentence reading, "To expand the corrosive energy of hot water before it enters the service lines," etc., in the middle of the first column of page 212, should read: "To expend the corrosive energy of hot water before it enters the service lines appeared to be the logical and direct course to follow."

Industrial Information

Metal Lath in Library Buildings

A series of library buildings are presented in *Expanded Metal Construction*, the house organ of the North Western Expanded Metal Company, 37 West Van Buren Street, Chicago, Ill., for July. A discussion of library buildings and the part which they have played in the world's history is presented along with photographs of recent library buildings in which metal lath was used.

"A New Field for the Stucco Contractor" is said to be in the permanent plastering of suburban homes and farm buildings. Over-coating is also suggested as desirable practice for these purposes. A "New Type of Stucco Construction" is also discussed in this issue.

The Baker System of Industrial Transportation

The Baker R. & S. Co., Cleveland, Ohio, manufactures tractors and utility trucks for industrial purposes. These products are extensively described in the company's booklets and folders. The electric tractors are made in a number of different types, some with four-wheel drive and four-wheel steer; some with four-wheel drive and two-wheel steer; two-wheel drive and four-wheel steer, and the like. They are all designed and built, it is stated, "to perform heavy continuous service for long periods of time with minimum attention." In another folder describing these tractors feature is made of the fact that the trucks turn within their own length, affording an appreciable source of space in aisles and alleys of industrial plants. It is also stated that the Baker R. & S. system of industrial transportation provides a method of inter-departmental handling that "will yield the greatest economy in labor without sacrifice of space."

Where any of the various types of trucks and tractors are maintained it will be found valuable to know that 98 per cent of all parts are interchangeable on all the different models.

In these booklets full details are given of the construction and operation of these trucks and tractors.

Heating Ducts for Factories

The United States Gypsum Company, 205 West Monroe Street, Chicago, has published a folder describing the heating and ventilating duct construction made possible by the use of Pyrobar partition tile. The facts that they are available in all sizes, at a low cost; that they make possible struck joints, smooth, clean surfaces, thereby reducing friction, eliminate condensation, and are known as insulating material, are presented by this company as further arguments in favor of Pyrobar for these purposes.

Kewanee Products in South America

In *The Walworth Log*, the house organ of the Walworth Mfg. Company, Boston, Mass., for July, the South American offices of this company are illustrated and described. A great deal of general information regarding the countries in which this company is represented is also given. These include Brazil and Chile, and are written by the company's representatives in these countries. *The Walworth Log* always contains timely discussions of world affairs, and a very worthwhile propaganda on the subject of thrift and other national issues of like sort. This company manufacturers plumbing specialties and other such supplies.

The Reflectolyte System

The Reflectolyte Company, 914 Pine Street, St. Louis, Mo., has issued a large booklet describing their patent lighting system. It is stated that the Reflectolyte is a scientifically constructed lighting unit, designed to radiate and diffuse the brilliant light of modern high-intensity lamps. This unit is made of "fired-on" porcelain, with the result that the reflecting surface is impervious to wear and will remain white indefinitely after installation and use. Ample illustration is given of the many different styles and types of fixtures manufactured by this company, all of which are also described in detail.