THE AMERICAN ARCHITECT

Vol. CII. WEDNESDAY, SEPTEMBER 11, 1912 No. 1916

ELEVATORS

WITH SPECIAL REFERENCE TO INSTALLATION IN FEDERAL BUILDINGS UNDER CONTROL OF THE TREASURY DEPARTMENT

By NELSON S. THOMPSON, *Chief Mechanical and Electrical Engineer, Office of Supervising Architect of the Treasury Department*

THE following article prepared primarily as a guide to the installation of elevators to Federal buildings, is naturally a description of good elevator designing practice. The facts set forth, and the specific details that form the requirements of Federal installation are valuable guides to architects in all classes of elevator work, and are of course subject to such changes to meet varying conditions as will suggest themselves to the man in practice.—Editor.

ON deciding upon the number, type, and speed of elevators for modern structures, architects it would seem have not been giving the subject the careful preliminary study its importance demands, and unfortunate results may be noted in many recently-erected buildings having an inadequate elevator equipment. This article is offered in the hope that it may be of benefit to designers in solving this important question.

With the aid of individual experience and judgment, a close approximation of the number of elevators which should be installed in a given building may be based on the following facts in regard to elevator service as stated by a prominent consulting engineer in an excellent treatise entitled "Elevator Service."

"Tenants object to waiting more than thirty seconds for a car, or, in other words, demand a schedule not exceeding thirty seconds.

The occupancy of first-class office buildings in large cities will vary from one tenant for 100 square feet of rentable floor area in brokers' offices to one tenant for 150 square feet in office buildings devoted to real estate agents, etc., on the less important streets. In first-class apartment houses it will average one tenant to 300 square feet rentable floor area, and in modern high-class hotels one to 240 square feet. For preliminary calculations for the average office building with mixed tenancy, one tenant to 150 square feet may be assumed.

The rentable area in an average office building is generally sixty per cent. on the gross area.

The maximum passenger-carrying capacity of an elevator is reached when the car stops at eighty per cent. of the number of floors which the elevator is designed to serve.

An elevator should be designed on the basis of making eighty per cent. of its landings to handle the tenants of the building one way in one-half hour, if their occupations are of a character which indicate that the majority will begin and stop work at about the same time.

The average load carried by the elevator is equal to forty per cent. of the number of floors served multiplied by 150 pounds.

The speed of local elevators in a modern office building of more than ten stories should be at least 400 feet per minute, and the speed of express elevators should be approximately 600 feet per minute.

In estimating the round-trip time of an elevator it has been found that approximately six seconds is required to receive and discharge each passenger; and to this should be added nine seconds for time lost at upper and lower landings in handling gates.

The round-trip time of an elevator in a good office building varies between one and one-half and three minutes, depending upon height of building, speed of elevator, etc. As a general rule, the time allowed for a round trip should not exceed two and one-half minutes."

With above data, and knowing the gross floor area of a building and the number and height of stories, the elevator equipment and its duty can be determined.

Assume a building with a total gross area of 130,000 square feet and a height of 156 feet above the first floor, divided into thirteen stories. The rentable area will be about sixty per cent. of 130,000 or approximately 80,000 square feet. Assuming an occupancy of one tenant to 150 square feet, the number of tenants to be handled by the elevator in one-half hour is 533, or 1,066 per hour.

There being twelve landings to be served above the first floor, the number of passengers per trip one way each elevator will be eighty per cent. of twelve or about ten passengers. As each elevator will on an average taken ten persons per trip, it is necessary to know the round-trip time to arrive at the capacity per hour. Ten passengers will require sixty seconds to enter and leave car, to which must be added nine seconds for time lost at terminal landings, plus actual running time. The speed in this example will be assumed as 400 feet per minute, or an average speed of 5.33 feet per second, making due allowance for retardation, etc.

To run 156 feet by two, or 312 feet, the time will be 312 divided by 5.33, or, approximately, fifty seconds; and the total time will be fifty plus sixty plus nine equals 119 seconds, or about two minutes, which is well within the limit set of two and one-half minutes for a round trip. This speed will give approximately thirty round trips per hour, and each car will then handle thirty multiplied by ten equals 300 persons; and as the total number of persons is 1,066 per hour, four elevators will be sufficient. The schedule will be the round-trip time divided by the number of elevators, or two minutes divided by four, giving thirty seconds, which is the schedule desired.

The area of the car floor in the example given would be ten multiplied by two plus four equals twenty-four square feet, as an allowance of two square feet is made for each passenger and four square feet for the operator. The car should be close to six feet, measured between rails, and four feet deep. The average number of passengers carried per trip will be forty per cent. of the number of floors served or twelve multiplied by four-tenths, say five; and assuming the weight of each passenger and of the operator as 150 pounds, the result five multiplied by 150 plus 150 equals 900 pounds, the average load carried by the elevator.

As a very rough guide in preliminary calculations for Federal buildings one elevator for 25,000 square feet of floor area may be assumed as satisfactory.

In the treatise hereinbefore referred to the author brings out certain points about elevator service which are frequently overlooked by architects and engineers. At least two of these points should be always kept in mind, *i.e.*, that in high buildings the elevators should be capable of quickly emptying the upper floors in case of a fire; and that in the design of any plant sufficient reserve capacity should be allowed so that elevator repairs may be made during regular working hours without inconvenence to the occupants of the building.

The elevators should always be grouped, and occupy a prominent position in relation to the building entrance.

SIZE OF CARS.

As previously stated, in proportioning the size of the platform per passenger elevators for large and tall office buildings, it is assumed that a car will stop at eighty per cent. of the landings for which the elevator is designed to stop; that one passenger is estimated to be discharged at each of said floors; and that two square feet per passenger and four square feet for the operator are allowed in determining the minimum size of car. This size should also be nearly the maximum and the final size of the car should not vary much from this determination, for the reason that a larger car means more passengers, longer stops, and consequently a schedule lower than that for which the plant was designed.

When installing a passenger elevator in an old Federal building where no hatchway was originally provided, the minimum size of car is made four feet six inches by four feet six inches. This is an undesirable size and is used only where the conditions demand it.

In old buildings where conditions permit and in all new buildings the cars are made six feet measured between the rails, and five feet deep. A wide and shallow car is much more desirable than a square car, or a car with a great depth and a narrow dimension between rails, as passengers have a tendency to crowd to the front of a car. No car should be larger than six feet by six feet, except in a department store, where an eight feet by six inches deep car should be the maximum.

The use of pilasters in cars is not desirable and should be discouraged.

In Federal buildings the cars for freight elevators, mail lifts, and bounded wareroom lifts are made six feet by six feet, which is the most desirable size. Ash-lifts and hand-power mail-lifts are generally made four feet by four feet, and cars for electric dumb-waiters three feet four inches by three feet four inches.

Elevator hoistways are made one foot wider than car to allow for the guide rails and nine inches to twelve inches deeper, the front of car being kept one and one-half inches away from the entrance threshold.

In office buildings up to ten stories the car should be five feet wide measured between the rails and four feet four inches deep. From ten to fifteen stories the cars should be approximately six feet wide and four feet four inches deep, and from fifteen to nineteen stories, if all elevators are local, the cars should be approximately six feet six inches wide and five feet deep.

(To be concluded)

TYPICAL SUITE DRAWING ROOM

THE COPLEY-PLAZA HOTEL, BOSTON, MASS

MR. H. J. HARDENBERGH, ARCHITECT

THE CURRENT ARCHITECTURAL PRESS

An article in the August *Architectural Record,* by Arthur G. Byne, intended as an appreciation of the work of Charles Keck, sculptor, cannot, we fear, be regarded as an accurate statement of the relations ordinarily existing between architect and sculptor. Mr. Byne writes:—"They (architecture and sculpture) should have certain common characteristics; each should in a way reflect the other. But unfortunately, the groups of men producing each generally follow the modern mania for concentrating, and work with but little understanding of each other's province. Almost any important building in New York proves this. Its sculpture though often excellent in separate units seems unrelated to the architecture. The niches and pedestals for it were not in the architect's mind from the very beginning, etc., etc."

(FROM THE BRICKBUILDER)

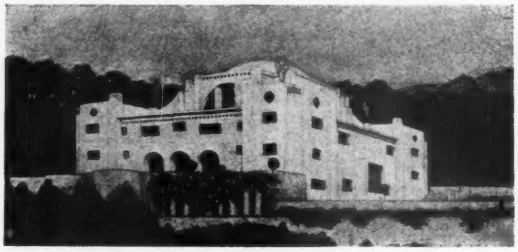
DETAIL OF BELFRY OF A CHURCH AT ACATEPEC, MEXICO

That under proper and usual conditions the architect dominates the sculpture that adorns his building, even to the extent in some instances of supplying sketches that convey more than a suggestion and often represent the completed design, is probably generally conceded. Important buildings that have received more than usual sculptured enrichment have almost invariably been dominated by their architects and every detail of its placement has come under their closest scrutiny. To say that the niches and pedestals were not in the architect's mind or that he had

(FROM ARCHITECTURE)

TERRACE OF A HOUSE AT BRYN MAWR, PA.
MR. CHARLES A. PLATT, ARCHITECT

(FROM THE INTERNATIONAL STUDIO)



A HOUSE IN POLAND
MR. M. H. BAILLIE SCOTT, ARCHITECT

not carefully studied them as well as the figures that were to rest in or on them is a statement that seems to cast reflection on the professional conduct of many distinguished architects. Happily actual cases of such dereliction of duty to client are rare.

The third paper of Mr. Robert C. Spencer's series on "Building the House of Moderate Cost," an article by Mr. Sheldon Cheney on "The Book Plate and the Architect," and Mr. Embury's illustration of "Early American Churches," are features of this issue.

The illustrations of current architecture present few examples and the majority of these are familiar by reason of their previous publication in other journals.

(FROM THE ARCHITECTURAL RECORD)

AMASA STONE MEMORIAL CHURCH, CLEVELAND, O.
MR. HENRY VAUGHN, ARCHITECT

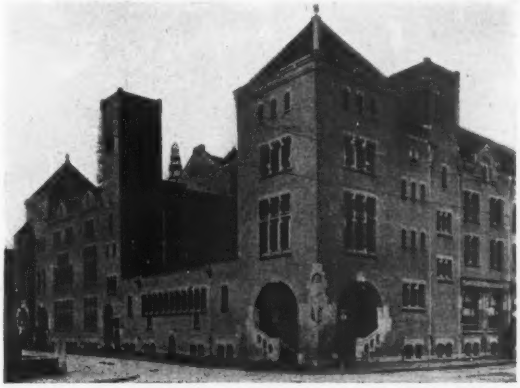
The July issue of *The Brickbuilder* has for its leading article the first of a series by Dr. S. S. Goldwater, on "Hospital Planning." Dr. Goldwater is well qualified to treat of this subject. This series will no doubt be read with unusual interest.

Mr. Elisha Harris Jones continues his series on the "Development of Duplex Apartments"—treating in this issue of the Studio type.

Mr. Magonigle's articles on "Commemorative Monuments" are continued.

The illustrations are of a series of brick and terra cotta buildings, the particulars of which may be found in our index to current architectural press, elsewhere in this issue.

(FROM THE WESTERN ARCHITECT)



EXCHANGE BUILDING, AMSTERDAM
MR. H. P. BERLAGE, ARCHITECT

Readers of *The International Studio* find little difficulty in keeping abreast of the current happenings in the field of art in this country and in Europe. Like previous issues, that for August is a comprehensive digest of the progress of art.

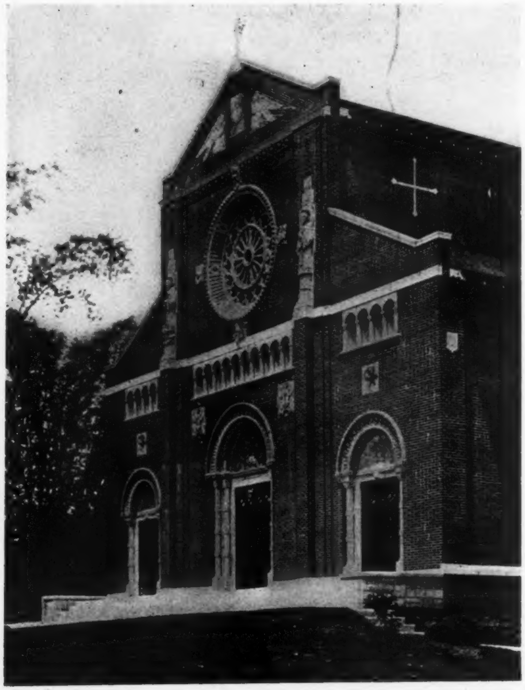
The usual article on "Recent Designs in Domestic Architecture in England" illustrates and describes a number of exam-

(FROM THE ARCHITECTURAL REVIEW)

THE NEW GERMANIC MUSEUM, HARVARD UNIVERSITY, CAMBRIDGE, MASS.
PROF. DR. GERMAN BESTELMEYER, ARCHITECT; WARREN & SMITH, ASSOCIATES

ples of English country houses, all of more or less merit in their design but presenting features of planning that do not entirely accord with accepted ideas in this country.

(FROM THE BRICKBUILDER)



CHURCH OF THE SACRED HEART, TAUNTON, MASS.
MR. MATTHEW SULLIVAN, ARCHITECT

The principal subject of illustration in *The Western Architect* for August, is some recent work in Amsterdam and Leipsic by Mr. H. P. Berlage, Architect.

The work shown possesses interest as presenting examples of the tendencies of architectural design in some parts of Europe.

It is quite apparent, however, that we have evolved more satisfactory and artistic methods of handling brick than are shown in the numerous examples illustrated. Especially is this true in the case of an insurance building at Leipsic, where repetition of parallel lines and the sharp contrast of the colored mortar employed produces a result that irritates by reason of its monotonous repetition.

Examples of recent work in this country, details of which will be found in the index to current periodicals, appear to represent types rather than definite examples. The lack of interest always present under such plan is further accented by reason of the omission in most instances of floor plans and architects' names.

The principal feature of *Architecture* for August is an appreciative article of the work of Mr. Charles A. Platt, and an extensive illustration of his country houses. Mr. Platt's work is of course invariably commendable and the fact that most of the subjects shown have had repeated illustration in the architectural press during the past six months in no way detracts from the interest which always surrounds it.

Aside from the article above referred to there is nothing of interest in the text of this issue.

Extracts from "The Log of the Dorian" form the leading article in *The Architectural Review* for July. These, we are informed, are the first of a series, being the adventures and a record of the observations of two young draughtsmen who in 1878–9 made a trip through navigable streams in Europe in a small boat. Naturally the point of view is that of the student and the accompanying sketches of a student character. It will be conceded that the "Log" is well written, and its perusal will doubtless interest readers who have journeyed over similar territory.

The principal subjects illustrated of recent work in this country are the new Germanic Museum of Harvard University, Prof. Dr. German Bestelmeyer, Architect, Messrs. Warren & Smith, Associated. Among foreign examples are two English churches by the late G. F. Bodley and some interior details of a country house by Mr. Ernest Newton.

THE AMERICAN ARCHITECT
Founded 1876
PUBLISHED EVERY WEDNESDAY BY
THE AMERICAN ARCHITECT (INC.)
No. 50 Union Square, New York
(Fourth Avenue and 17th Street)
G. E. SLY, PRESIDENT
E. J. ROSENCRANS, SECRETARY AND TREASURER

Address all communications to "THE AMERICAN ARCHITECT"

SUBSCRIBERS' RATES:
In the United States and Possessions (Porto Rico, Hawaii, Philippine Islands and Canal Zone), Mexico and Cuba
TEN DOLLARS PER YEAR, POSTAGE PAID
ALL OTHER COUNTRIES . . . $12.00 PER YEAR
SINGLE COPIES (Regular Issues), 25 CENTS

Entered at the Post-office, New York, as Second-class Matter

VOL. CII SEPTEMBER 11, 1912 No. 1916

A WELL MERITED REBUKE

THE revision of the Missouri State Capitol program, after a most dignified protest on the part of the Committee on Competitions of the American Institute is a recent important instance of the good results attending the work of this Committee, and of no less importance to the profession is the attitude of certain men and firms who were invited by the Rhode Island State Commission to submit designs for an Armory Building. The result of a communication from Messrs. Cram, Goodhue & Ferguson addressed to the Commission in charge, has, it is stated, caused that body to abandon the idea of a competition and to select a firm of architects to whom has been given outright the preparation of plans for the proposed building. This fact, showing unwillingness on the part of the State Commission to proceed in the matter along the lines of practice laid down by the Institute, seems to call for protest in some formal manner, against what is evidently an imputation that architects have not employed proper methods of regulating professional practice.

We believe it will be generally conceded by members of the profession that the letter of Messrs. Cram, Goodhue & Ferguson was a timely and pertinent one, and that in protesting against the assumption by the Commission that they could be induced to enter a competition so irregularly planned they have done much to uphold the dignity of the profession in general.

Their communication was in part as follows:

> "The sending of this invitation to us can be explained only in one of two ways: (a), that the commission is profoundly ignorant of the rudimentary laws governing the architectural profession in the United States and that they have made no effort to modify this ignorance; or that, (b), the commission desires to offer us a gratuitous insult. We have no reason to suppose that there are any grounds to substantiate the second alternative, and we are compelled, therefore, to fall back on the first. In this connection we can only say that we are surprised that a commission having in charge the carrying out of work of such magnitude should make no effort to find out anything of the laws that govern the architectural profession, and should, therefore, issue an invitation to a competition which would prevent any architect of good standing from taking part therein.
>
> "By consultation with any member of the American Institute of Architects, the commission could have obtained information as to the minimum requirements for a competition programme that would have been accepted by any member of the Institute, and we, therefore, do not feel it incumbent upon us to call their attention in detail to the many ways in which their invitation falls short of these minimum requirements. We desire to say, however, that apart from the fact that we are members of the American Institute of Architects, and therefore bound by the regulations thereof, the terms of this particular programme are so unjust, unprofessional and unbusinesslike in nature that we should reject them instantly even were we free lances and outside the official organization."

In another column in this issue is printed a communication from a Committee of the Rhode Island State Chapter, prepared for the information of the public in the territory of the Chapter as to the position of the profession on the subject of competitions. It is a timely and well considered document and should serve to correct many erroneous impressions concerning the ethics governing the practice of architecture, not entirely confined, unfortunately, to the general public.

A NATIONAL BOARD OF TRADE

IN an article recently published, Secretary Nagel of the Department of Commerce and Labor urged the creation of a National Board of Trade, a body somewhat similar in character and functions to those already existing in several countries abroad. It was suggested that this Board of Trade should be composed of representative men whose duty in part should be to collect and make available all possible information concerning vital questions that are before the people in order that Congress might be placed in possession of authoritative and reliable information on which to base remedial legislation.

Our representatives in the halls of Congress have been subject to much adverse criticism on account of the introduction of reports and proposed bills, that have at times shown, we regret to note, only a superficial knowledge of the subject in hand, and have demonstrated to those qualified to judge how very dangerous it is to attempt to disturb present conditions without a thorough knowledge of the subject under consideration. In short, there is little doubt that much of the information that is supplied to Congress at its request by various departments is void of the accuracy of statement that is necessary to make it of value. Proceeding on so wrong a premise, it is not to be wondered that certain proposed legislation has roused a storm of opposition and that members of Congress and particularly those at the heads of committees have been assailed as lacking a correct appreciation of the matters under report.

It is manifestly impossible for members of Congress to grasp all the intricacies of the many problems that are brought before them, and it therefore becomes necessary in order to avoid a recurrence of regrettable errors that there should be some means of securing reliable data that will aid in intelligent legislative work.

It would seem that a National Board of Trade such as proposed by Secretary Nagel might be a valuable adjunct in enabling Congress to keep in touch with the trend of thought on questions both economic and social and point the way to needed reforms. At any rate the idea is worth careful consideration.

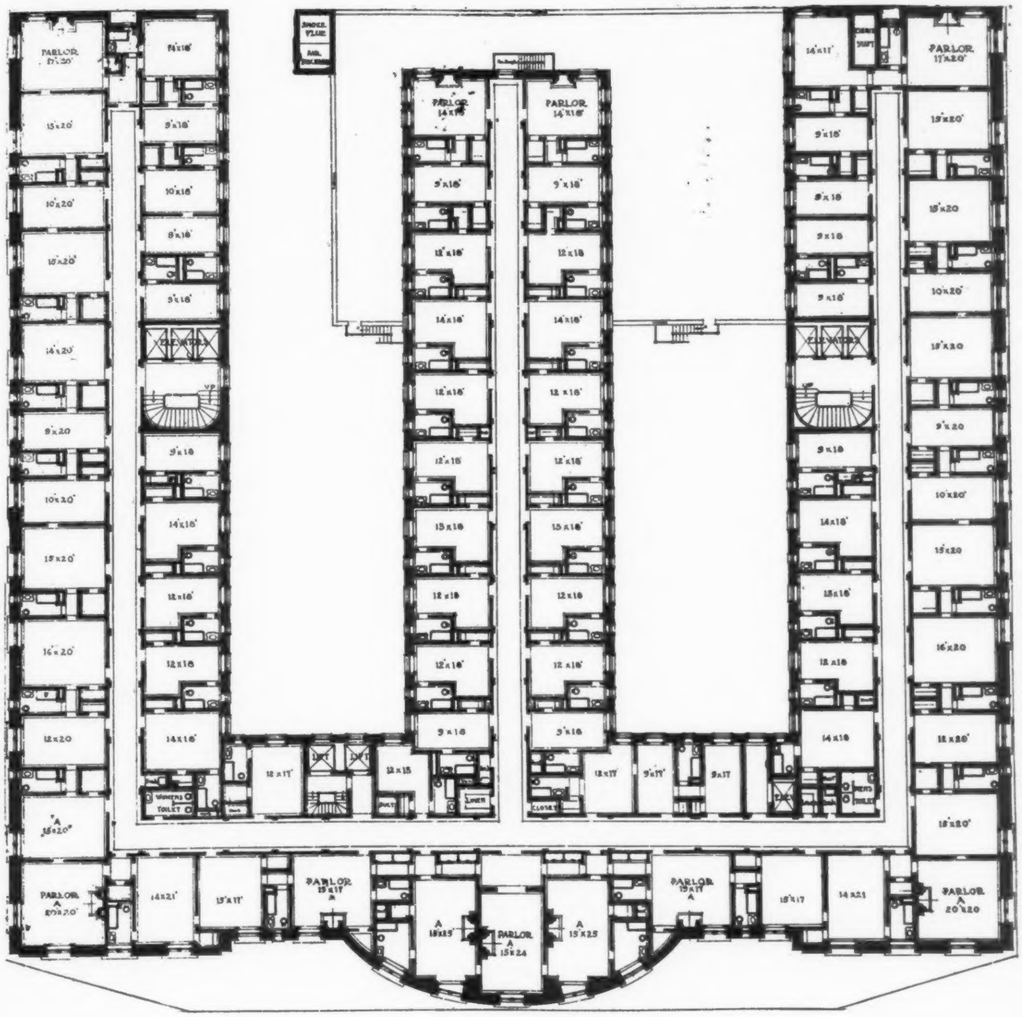
TYPICAL BED CHAMBER

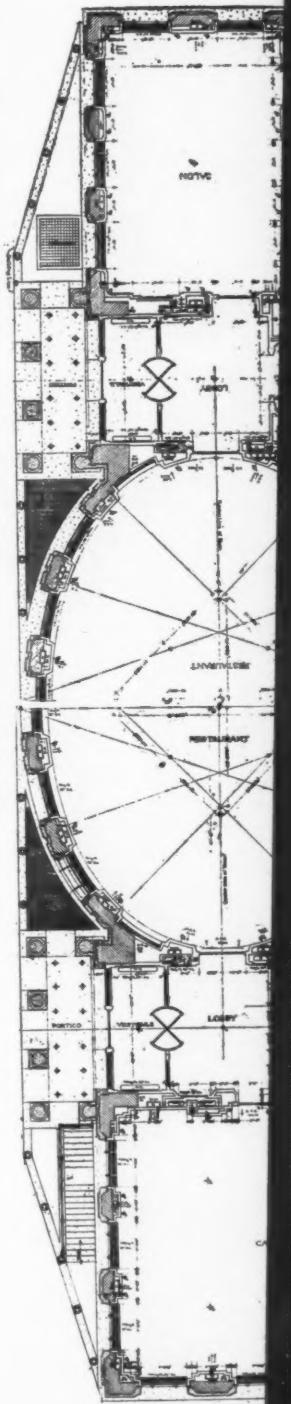
THE COPLEY-PLAZA HOTEL, BOSTON, MASS.

MR. H. J. HARDENBERGH, ARCHITECT

THE COPLEY-PLAZA HOTEL, BOSTON, MASS
MR. H. J. HARDENBERGH, ARCHITECT

DETAIL OF ENTRANCE
THE COPLEY-PLAZA HOTEL, BOSTON, MASS.
MR. H. J. HARDENBERGH, ARCHITECT

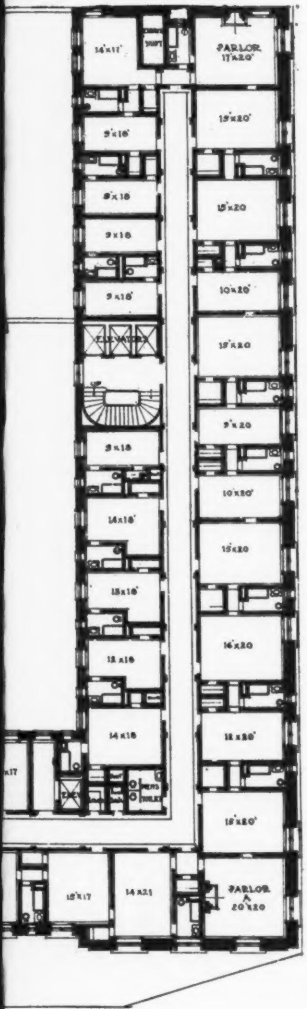


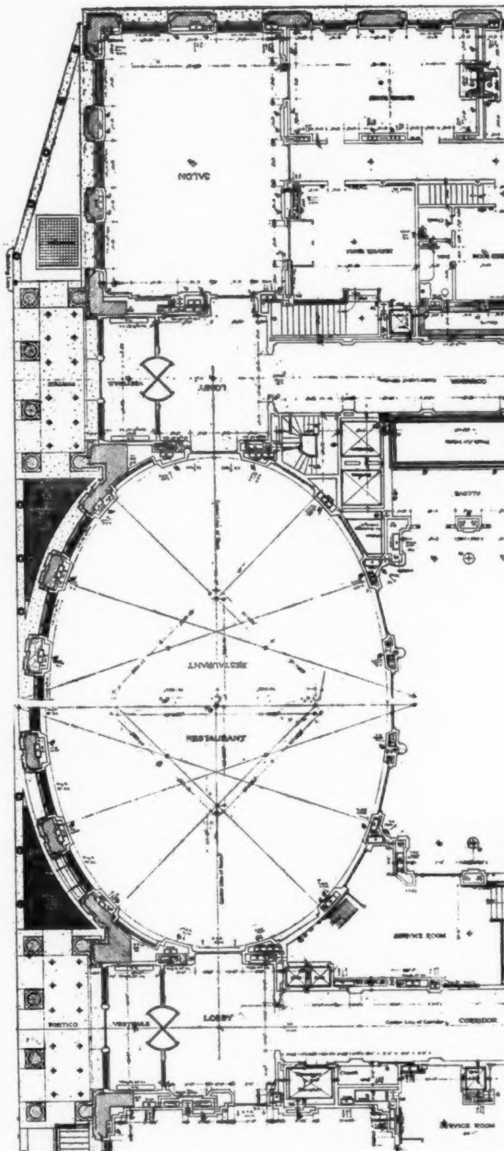


FIRST AND TYPICAL FLOOR PLANS

THE COPLEY-PLAZA HOTEL, BOSTON, MASS.

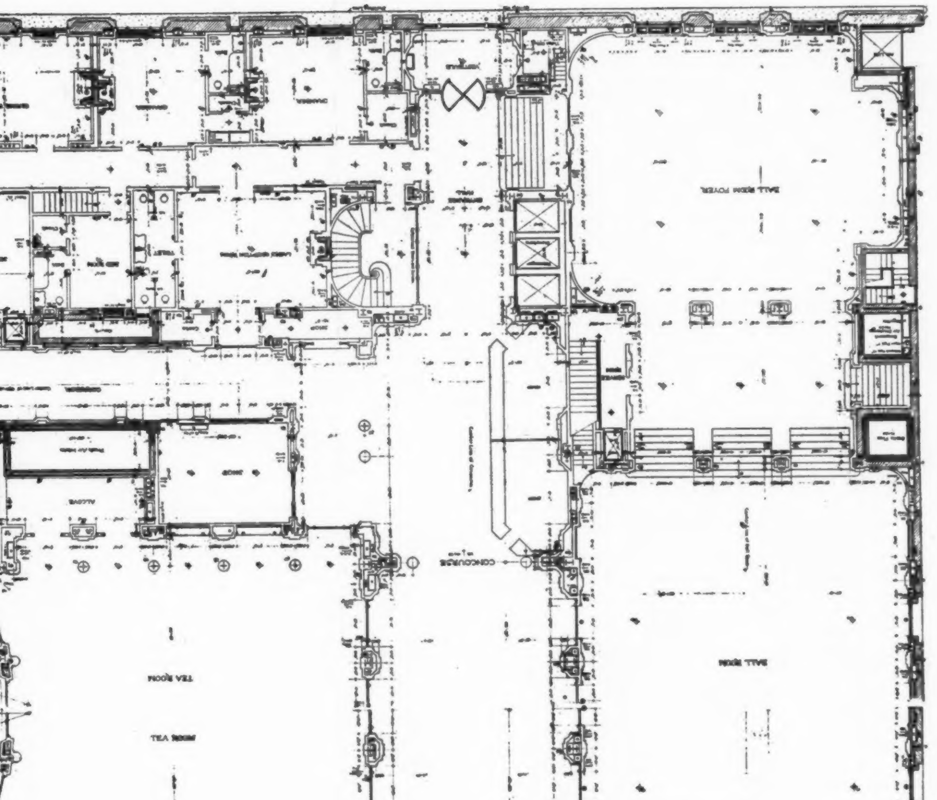
MR. H. J. HARDENBERGH, ARCHITECT


14'x11'
PARLOR 17'x20'
19'x20'
9'x18'
9'x18
9x18
15'x20
9x18'
10'x20'
ELEVATORS
15'x20
9'x20
9x18
10'x20'
14x18'
15'x20
13x18'
16'x20
12x18
14x18
12x20'
MEN'S TOILET
18'x20'
17
15'x17
14x21
PARLOR 20'x20


SALON
LOBBY
PANTRY
RESTAURANT
SERVICE ROOM
PORTICO
VESTIBULE
LOBBY
CORRIDOR
SERVICE ROOM
CAFE

ON, MASS.

CT



BALL ROOM FOYER
ALCOVE
SHOP
CONCOURSE
TEA ROOM
TEA ROOM
BALL ROOM
BALL ROOM
CONCOURSE
SERVICE ROOM
SHOP
CORRIDOR
SERVICE ROOM
BAR ROOM
ENTRANCE HALL
Coat Room
MEN'S READING ROOM
VESTIBULE
LADIES' RECEPTION ROOM
Toilet
SERVICE ROOM
Lift
DARTMOUTH STREET

THE FOYER

THE COPLEY-PLAZA HOTEL, BOSTON, MASS.
MR. H. J. HARDENBERGH, ARCHITECT

MAIN DINING ROOM

THE COPLEY-PLAZA HOTEL, BOSTON, MASS.

MR. H. J. HARDENBERGH, ARCHITECT

THE CAFE

THE COPLEY-PLAZA HOTEL, BOSTON, MASS.

MR. H. J. HARDENBERGH, ARCHITECT

THE TEA ROOM

THE COPLEY-PLAZA HOTEL, BOSTON, MASS.
MR. H. J. HARDENBERGH, ARCHITECT

THE BANQUETING ROOM

THE COPLEY-PLAZA HOTEL, BOSTON, MASS

MR. H. J. HARDENBERGH, ARCHITECT

LADIES' RECEPTION ROOM

THE COPLEY-PLAZA HOTEL, BOSTON, MASS.

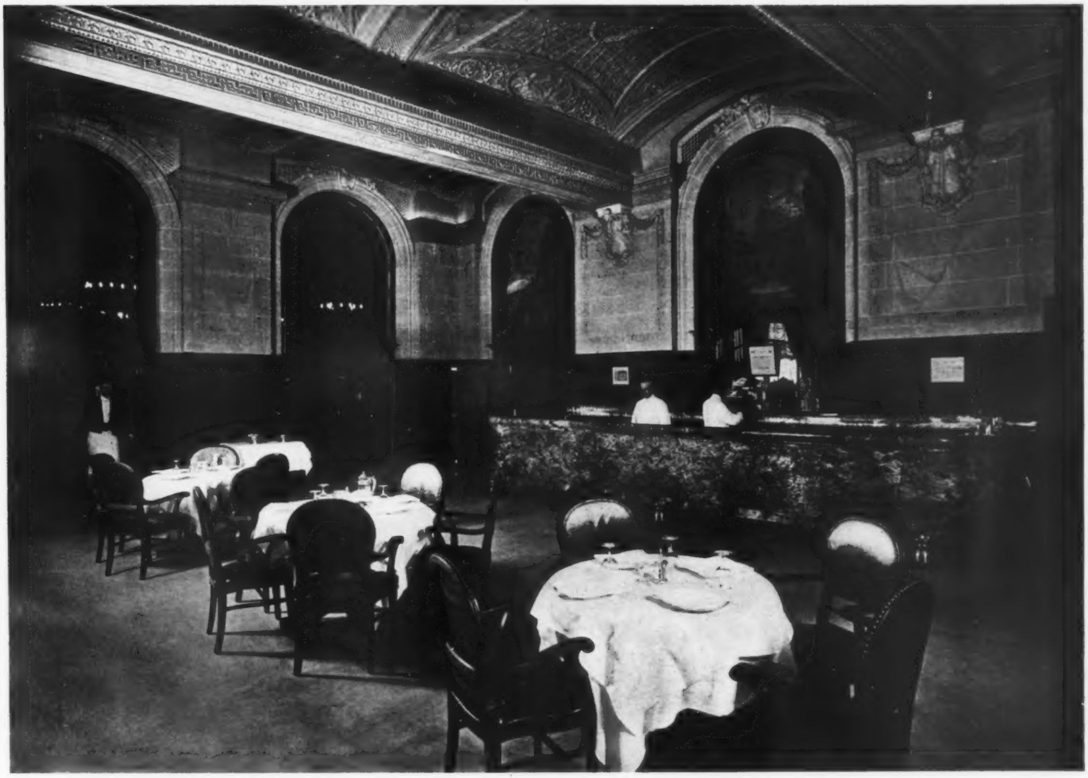
MR. H. J. HARDENBERGH, ARCHITECT

SIDE CORRIDOR

THE TEA ROOM

THE COPLEY-PLAZA HOTEL, BOSTON, MASS.

MR. H. J. HARDENBERGH, ARCHITECT



THE BAR

THE GRILL ROOM

THE COPLEY-PLAZA HOTEL, BOSTON, MASS.
MR. H. J. HARDENBERGH, ARCHITECT

COURT OF THE PALAZZO PODESTA, GENOA, ITALY