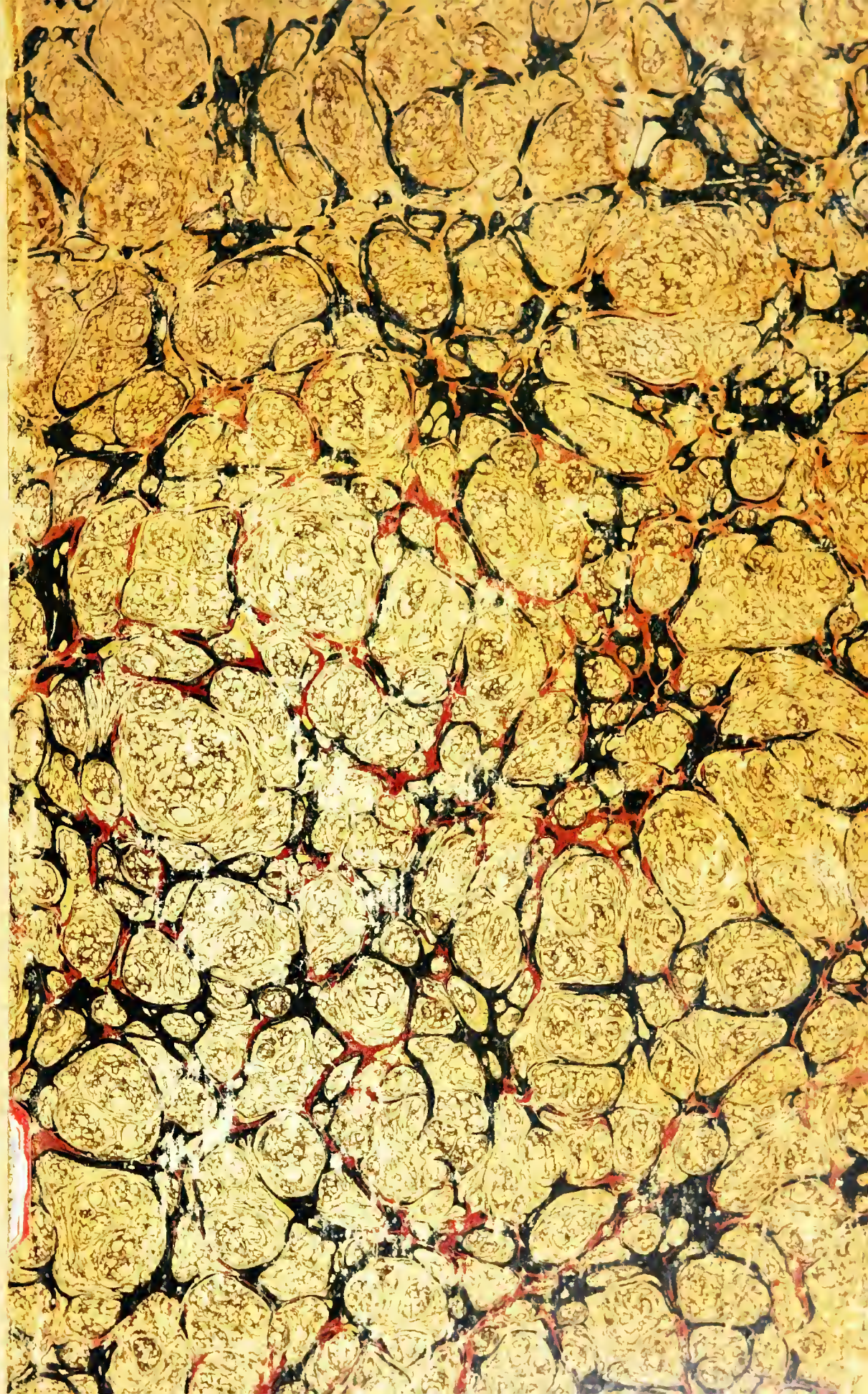


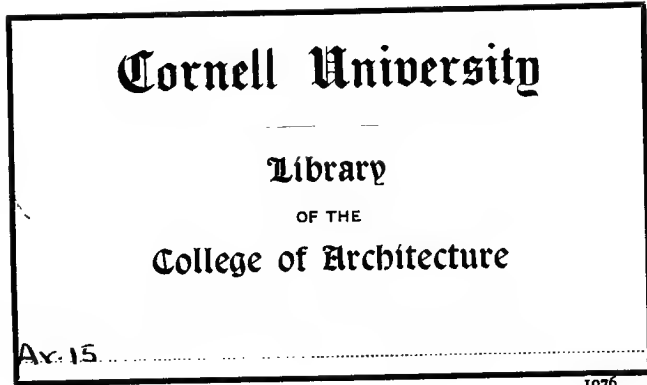
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# **The Building Law** of the **City of Boston**

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**Being Chapter 550 of Acts of 1907**  
with amendments to date



**PUBLISHED BY**  
**WILLIAM H. SAYWARD**  
Secretary National Association of Builders  
166 DEVONSHIRE STREET  
BOSTON  
OCTOBER, 1909

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# WHO'S WHO AND WHAT'S WHAT IN THE BUILDING BUSINESS

A BUREAU OF INFORMATION  
IN RE



*Persons carrying on the Business*  
*Specialties for use in the Business*  
*Legal Decisions concerning the Business*  
*Legislation affecting the Business*  
*Inventions of Value to the Business*  
*Skilled service for the Business*

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*Prices of Materials*  
*Quantity Surveys*

CONDUCTED BY  
**WILLIAM H. SAYWARD**  
SECRETARY OF  
THE NATIONAL ASSOCIATION OF BUILDERS  
166 DEVONSHIRE STREET, BOSTON

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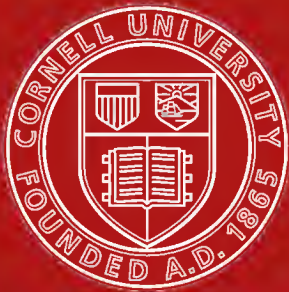
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# THE BUILDING LAW

## OF THE

### CITY OF BOSTON

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#### ACTS, 1907—CHAP. 550

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#### AN ACT RELATIVE TO THE CONSTRUCTION, ALTERATION, AND MAINTENANCE OF BUILDINGS IN THE CITY OF BOSTON

*Be it enacted, etc., as follows:*

SECTION 1. There shall be in the city of Boston a department to be called the building department, which shall be under the charge of the building commissioner. The commissioner, who shall have had at least five years' experience as an architect, a builder, or a civil engineer, shall be appointed by the mayor, for a term of five years. He shall receive such salary as shall be fixed by the city council, with the approval of the mayor.

The present officers and employees of the building department, except the board of appeal, shall hold their several offices and positions until removed or discharged according to law.

The commissioner may, with the approval of the mayor, appoint such number of inspectors, employees, and assistants as the city council shall, from time to time, determine. No person shall be appointed as inspector of construction who has not had at least five years' experience as a builder, civil engineer, or architect, or as a superintendent or foreman or a competent mechanic in charge of construction.

The commissioner may appoint as his deputy an inspector in the department who shall, during the absence or disability of the commissioner, exercise all the powers of the commissioner. No officer connected with the department shall engage in any other business or be interested in the doing of work or the furnishing of material for the construction, repair or maintenance of any building, or in the making of plans or of specifications therefor, unless he is the owner of the building or a member of the board of appeal.

The clerk of the department shall, under the direction of the commissioner, keep a record of the business of the department, and the commissioner shall submit to the mayor a yearly report of such business. The records of the department shall be open to public inspection. The commissioner may require plans and specifications of any proposed structure or for the alteration of any structure or building to be filed with him, duplicates of which, when approved by the commissioner, shall be kept at the building during the progress of the work. Such duplicates shall be open to the inspection of any inspector in said department.

The commissioner shall grant permits for the construction, alteration, removal or tearing down of buildings or structures, and for plumbing, gas fitting, and the setting and maintenance of steam boilers and furnaces when applications for the same are made and filed in conformity with law.

All permits issued by the commissioner shall be on printed forms approved by him.

If the commissioner finds that the terms of a permit are being violated, he may, after notice mailed to the person to whom the permit was issued, order the whole or any part of the work, which is being done under the permit, to be stopped, and such work shall not be resumed until the terms of the permit have been complied with.

All applications for permits under the provisions of this act shall be in writing, on forms furnished by the department. The commissioner may require the material facts set forth in the same to be verified by the oath of the applicant; he may also require, in his discretion, a survey of a lot on which any proposed building is to be erected to be filed with the application. Every application shall state the name and address of the owner.

SECT. 2. The commissioner, or one of his inspectors, shall examine as often as is practicable every building in the course of construction or alteration, and shall make a record of all violations of this act and of all other matters relative thereto. The publication of such records with the consent of the commissioner shall be privileged.

SECT. 3. The commissioner, or one of his inspectors, shall examine any building reported as dangerous or damaged, and shall make a record of such examination, stating the nature and estimated amount of the damage, and the purpose for which the building was used, and in case of fire the probable origin thereof; and shall examine all buildings in respect to which applications have been made for permits to raise, enlarge, alter, or repair, and shall make a record of every such examination.

SECT. 4. The commissioner, or one of his inspectors, shall inspect every building or other structure or anything attached to or connected therewith which he has reason to believe is unsafe or dangerous to life, limb, or adjoining buildings, and if he finds it unsafe or dangerous, he shall forthwith in writing notify the owner, agent, or any person having an interest therein, to secure the same, and shall affix in a conspicuous place upon its external walls a notice of its dangerous condition. The notice shall not be removed or defaced without his consent.

The commissioner may with the written approval of the mayor order any building which in his opinion is unsafe to be vacated forthwith.

SECT. 5. The person notified as provided in the preceding section shall secure or remove said building, structure, attachment or connection forthwith. If the public safety so requires, the commissioner, with the approval of the mayor, may at once enter the building or other structure, the land on which it stands or the abutting land or buildings, with such assistance as he may require, and secure the same, and may erect such protection for the public by proper fence or otherwise as may be necessary, and for this purpose may close a public highway.

SECT. 6. There shall be in said department a board to be called the board of appeal. Said board shall consist of five members appointed by the mayor in the following manner: One member from two candidates, one to be nominated by the Real Estate Exchange and Auction Board and one by the Massachusetts Real Estate Exchange; one member from two candidates, one to be nominated by the Boston Society of Architects and one by the Boston Society of Civil Engineers; one member from two candidates, one to be nominated by the Master Builders Association and one by the Contractors and Builders Association; one member from two candidates to be nominated by the Building Trades Council of the Boston Central Labor Union; and one member selected by the mayor. These appointments shall be subject to confirmation by the board of aldermen. The appointments first made shall be for the terms of one, two, three, four, and five years, respectively, so that the term of one member shall expire each year. All subsequent appointments shall be for the term of five years. Vacancies shall be filled in the same manner in which original appointments are made. Each member of said board shall be paid ten dollars per day for actual service but not more than one thousand dollars in any one year. No member shall act in any case in which he is interested, and in case any member is so disqualified, the remaining members shall designate a substitute.

All the members of said board shall be residents of or engaged in business in Boston.

Every decision of the board shall be in writing and shall require the assent of at least three members.

SECT. 7. An applicant for a permit whose application has been refused may appeal therefrom within ninety days. A person who has been ordered by the commissioner to incur any expense may within ten days after being notified of such order appeal therefrom by giving to the commissioner notice in writing of his appeal. Such notice or a certified copy thereof shall at once be transmitted by the commissioner to the board of appeal. After notice given to such parties as the board shall order, a hearing shall be had, and the board shall affirm, annul, or modify said refusal or order. The board may vary the provisions of this act in specific cases which appear to them not to have been contemplated by this act although covered by it, or in cases where manifest injustice is done, provided that the decision of the board in such a case shall be unanimous and shall not conflict with the spirit of any provision of this act.

The decision shall specify the variations allowed and the reasons therefor, and shall be filed in the office of the commissioner within ten days after the hearing. A certified copy shall be sent by mail or otherwise to the applicant and a copy kept publicly posted in the office of the commissioner for two weeks thereafter. If the order or refusal of the commissioner is affirmed, such order or refusal shall have full force and effect. If the order or refusal is modified or annulled, the commissioner shall issue a permit in accordance with such decision.

The provisions of this section shall also apply to any similar action or order of the commissioner of wires, under the provisions of chapter two hundred and sixty-eight of the acts of the year eighteen hundred and ninety-eight, or of any amendment thereof or addition thereto, except that in respect thereto the words "commissioner of wires" shall be substituted for the word "commissioner."

SECT. 8. Methods of construction or maintenance equivalent to those required by the provisions of this act may be allowed with the written consent of the commissioner and the board of appeal specifying the same. A record of the required and the equivalent method allowed shall be kept in the office of the commissioner.

It shall be the duty of the board of appeal to submit to the mayor on or before the first day of February in each year a report giving a summary of all decisions of the board, together with such recommendations for revision of the law as may seem to them advisable. The commissioner shall cause the report to be printed as a separate document for public distribution.

Any requirement necessary for the strength or stability of any proposed structure or for the safety of the occupants thereof, not specifically covered by this act, shall be determined by the commissioner, subject to appeal.

SECT. 9. The building limits\* of the city of Boston as they now exist shall continue until changed by ordinance, and the city council may by ordinance from time to time extend and define said building limits, and may establish other limits in any part of the city within which every building built after the establishment thereof shall be of the first or second class. This restriction shall not apply to wharves, nor to buildings not exceeding twenty-seven feet in height on wharves, nor to market sheds or market buildings not exceeding such height, nor to elevators for the storage of coal or grain, if the external parts of such buildings, elevators, or other structures are covered with slate, tile, metal, or other equally fireproof material, and the mode of construction and the location thereof are approved by the commissioner. Temporary structures to facilitate the prosecution of any authorized work may be erected under such conditions as the commissioner may prescribe.

SECT. 10. The provisions of this act shall not apply to bridges, quays, or wharves, nor to buildings on land ceded to the United States or owned and occupied by the Commonwealth, nor to the Suffolk County court house, jail, or house of correction, nor to railroad stations, nor to portable school buildings erected and maintained by the schoolhouse department, nor to voting booths erected and maintained by the board of election commissioners.

Except as otherwise provided by law, the provisions of this act shall not be held to deprive the board of health, the police commissioner, the board of street commissioners, the board of park commissioners, the board of examiners of gas

\* See page 33 for "Building Limits."



fitters, the commissioner of wires, or the fire commissioner of the city of Boston of any power or authority which they have at the date of the passage of this act, or of the remedies for the enforcement of the orders of said boards or officers; unless such powers, authorities, or remedies are inconsistent with the provisions of this act; nor to repeal any existing law, not herein expressly repealed, except so far as it may be inconsistent with the provisions of this act.

## DEFINITIONS.

SECT. 11. In this act the following terms shall have the meanings respectively assigned to them:—

First class building:— A first class building shall consist of fireproof material throughout, with floors constructed of iron, steel or reinforced concrete beams, filled in between with terra-cotta or other masonry arches or with concrete or reinforced concrete slabs; wood may be used only for under and upper floors, windows and door frames, sashes, doors, interior finish, hand rails for stairs, necessary sleepers bedded in the cement, and for isolated furrings bedded in mortar. There shall be no air space between the top of any floor arches and the floor boarding.

Second class building:— All buildings not of the first class, the external and party walls of which are of brick, stone, iron, steel, concrete, reinforced concrete, concrete blocks, or other equally substantial and fireproof material.

Third class building:— A wooden frame building.

Composite building:— A building, partly of second class and partly of third class construction.

Foundation:— That part of a wall below the level of the street curb, or, if a wall is not on a street, that part of the wall below the level of the highest ground next to the wall, or, if so construed by the commissioner, that part of a party or partition wall below the cellar floor.

Height of a building:— The vertical distance of the highest point of the roof above the mean grade of the curbs of all the streets upon which it abuts, and if it does not abut on a street, above the mean grade of the ground adjoining the building.

Party wall:— A wall that separates two or more buildings, and is used or adapted for the use of more than one building.

Partition wall:— An interior wall of masonry in a building.

Thickness of wall:— The minimum thickness of such wall.

Story of a building:— That part of a building between the top of any floor beams and the top of the floor or roof beams next above.

Basement:— That story of a building not more than forty per cent of which is below the grade of the street.

Cellar:— That part of a building more than forty per cent of which is below the grade of the street, and in third class buildings that part of the building which is below the sills.

Gas fitting shall mean the work of putting together any fittings, pipe or fixtures or other appliances which are to contain gas for heat, light or power purposes and will be subject to inspection under existing laws.

## REQUIREMENTS FOR ALL BUILDINGS.

SECT. 12. No building, structure or foundation shall be constructed or altered without a permit, and such work shall be done in accordance with drawings bearing the approval of the commissioner.

Every structure in process of construction, alteration, repair or removal, and every neighboring structure or portion thereof affected by such process or by any excavation, shall be sufficiently supported during such process.

The commissioner may take such measures as the public safety requires to carry these provisions into effect.

All buildings shall have leaders sufficient to discharge the roof water in such a manner as not to flow upon any public way or any neighboring property. Such leaders may project into a public way not over seven inches.

Every chimney flue shall be carried to a height sufficient to protect adjoining buildings from fire and smoke, and, unless the roof is covered with incombustible material, shall extend at least four feet above the highest point of contact with the roof.

Every permanent building more than twenty feet high having a flat roof shall have permanent means of access to the roof from the inside by an opening not less than two feet by three feet, with a fixed stepladder.

Every building shall have, with reference to its height, condition, construction, surroundings, character of occupation and number of occupants, reasonable means of egress in case of fire, satisfactory to the commissioner, except that in all factories or workshops hereafter built or altered, of second class construction, where ten or more persons are employed above the second floor, one exit shall consist of a fireproof stairway enclosed in incombustible material.

Water pipes in every building shall be properly protected from frost.

All chimneys of masonry construction shall have walls at least eight inches thick, or be constructed of four-inch brick walls with a suitable flue lining.

Every building used for habitation shall have such number of water-closets as the board of health may require; every building where persons are employed shall have at least one water-closet for every twenty persons therein employed, and in any building where both sexes are employed, separate accommodations shall be furnished for men and women. Every enclosure containing one or more water-closets shall be provided with adequate ventilation to the outer air either by window or by suitable light shaft.

In every first and second class building all of the outside finish shall be of incombustible material, except window and door frames, and except finish about show windows in the first story. Where store fronts are carried up more than one story the columns and lintels shall be of, or finished with, incombustible material; but in no case shall store fronts be carried more than two stories unless the same are constructed and finished throughout with fireproof material, except window and door frames.

Every ventilating flue shall be constructed of, or lined with, incombustible material.

Every floor in second class buildings shall have its beams tied to the walls and to each other with wrought-iron straps or anchors at least three eighths of an inch thick by one and one half inches wide, and not less than eighteen inches long, so as to form continuous ties across the building not more than ten feet apart. Walls running parallel, or nearly

parallel, with floor beams shall be properly tied once in ten feet to the floor beams by iron straps or anchors of the size above specified.

Every wooden header or trimmer more than four feet long, carrying a floor load of over seventy pounds per square foot, shall, at connections with other beams, be framed or hung in stirrup irons, and joint-bolted. All tail beams and similar beams of wood shall be framed or hung in stirrup irons.

PROHIBITIONS.

SECT. 13. No alteration or repair of a wooden building within the building limits shall be made without a permit from the commissioner, and no permit to increase the height or ground area of such a building shall be granted, nor shall a permit for alterations or repairs be granted if the estimated cost of the proposed alterations or repairs exceeds one half of the cost of a like new building.

No wooden building, within or without the building limits, shall be moved to any position within the building limits.

No recess or chase shall be made in any external or party wall so as to leave the thickness at the back less than eight inches.

No roof or floor timber entering a party wall shall have less than four inches of solid brickwork between it and the end of any other timber.

No part of any roof shall be constructed in such a manner as to discharge snow, ice, or other material upon a public street or alley.

No elevated staging or stand for observation purposes shall be constructed or occupied upon the roof of any building.

No chimney shall be corbelled from a wall more than the thickness of the wall.

No chimney shall be hung from a wall which is less than twelve inches thick.

No masonry shall rest upon wood, except piles and mud sills.

No part of any floor timber shall be within two inches of any chimney.

No studding or furring shall be within one inch of any chimney.

No furnace or boiler for heating shall be placed upon a wooden floor.

No smoke pipe shall project through any external wall or window.

No steam, furnace, or other hot air pipes shall be carried within one inch of any woodwork, unless such pipes are double or otherwise protected by incombustible material.

No observation stand shall be constructed or maintained except in accordance with plans approved by the commissioner.

No closet of any kind shall be constructed under any staircase leading from the cellar or basement to the first story.

No boiler shall be placed or maintained under any public way.

No part of any structure, except cornices, permanent awnings, string courses, window caps and sills, bay windows, and outside means of egress, as otherwise provided, and signs as provided in chapter three hundred and fifty-two of the acts of the year eighteen hundred and ninety-five, shall project over any public way or square. No cornice or bay window shall so project more than three feet; nor more than twelve inches over a way of a width of thirty feet or less.

No building within forty feet of the property of any adjoining owner shall be erected for or converted to use as a stable, unless such use is authorized by the board of health after a public hearing. Written notice of such hearing shall be given to the adjoining owners, and published at least three times in at least two newspapers published in Boston, ten days at least before the hearing.

MATERIALS.

Strength of Materials.

SECT. 14. The stresses in materials hereafter used in the construction of all buildings, produced by their own weight and the loads herein specified, shall not exceed the limits assigned in the following paragraphs of this section:—

(a) TIMBER.

Unit Stresses in Pounds per Square Inch.

	On Extreme Fibre of Beams.	Shearing along the Grain.	Compression Perpendicular to the Grain.
White pine and spruce, . . . . .	1,000	80	250
White oak, . . . . .	1,000	150	600
Yellow pine (long-leaved), . . . . .	1,500	100	500

Stresses due to transverse loads combined with direct tension or compression shall not exceed the extreme fibre stresses given above.

In computing deflection, the modulus of elasticity shall be taken as follows:—

	Pounds per Square Inch.
White pine, . . . . .	750,000
Spruce, . . . . .	900,000
Yellow pine (long-leaved), . . . . .	1,300,000
White oak, . . . . .	850,000

Columns (centrally loaded).

For wooden columns with flat ends, where L is the length of the column, D is its least diameter, the average stress per square inch on a cross-section shall be limited as follows:—

$\frac{L}{D}$	AVERAGE STRESS PER SQUARE INCH.		
	White Pine and Spruce.	Long-leaved Yellow Pine.	White Oak.
0 to 10,	630	900	810
10 to 15,	595	850	765
15 to 20,	560	800	720
20 to 25,	525	750	675
25 to 30,	490	700	630

No column shall be used with a greater unsupported length than thirty times its least diameter. For excentric loads see section sixteen.

(b) WROUGHT IRON AND STEEL.

Unit Stresses in Pounds per Square Inch.

	Wrought Iron.	Steel. <sup>1</sup>
Extreme fibre of rolled beams or shapes, . . . . .	12,000	16,000
Tension, . . . . .	12,000	16,000
Compression in flanges of built beams, . . . . .	12,000	16,000
Shearing (see below for bolts), . . . . .	9,000	10,000
Direct bearing, including pins and rivets, . . . . .	15,000	18,000
Bending on pins, . . . . .	18,000	22,500
Modulus of elasticity . . . . .	27,000,000	29,000,000

For compression members twelve thousand for iron and sixteen thousand for steel, reduced according to the following formula:—

$$\frac{12,000 \text{ (or } 16,000 \text{ for steel)}}{1 + \frac{1}{20,000} \frac{L^2}{r^2}}$$

in which L is the length of the column in inches, and r is the radius of gyration in inches taken around the axis about which the column will bend (for free columns, the least radius of gyration).

The stresses due to transverse loads combined with direct tension or compression shall not exceed the extreme fibre stress given above for rolled beams and shapes, or in case of built members the above tension and compression stresses (see section sixteen).

Compression flanges of beams shall be proportioned to resist lateral flexure unless properly staved or secured against it. If the ratio of unsupported length of flange to width of flange does not exceed twenty, no allowance need be made for lateral flexure. If the ratio is seventy the allowable stress on the extreme fibre shall be one half of that above specified, and proportionally for intermediate ratios.

Shearing and bearing stresses on bolts shall not be higher than eighty per cent of those allowed by the above table. All connections in skeleton buildings, all splices in steel trusses and girders, and all connections of such trusses and girders to the sides of steel columns shall, if possible, be made by means of rivets rather than by bolts.

(c) CAST IRON.

Unit Stresses in Pounds per Square Inch.

Extreme fibre stress, tension, . . . . .	3,000
Extreme fibre stress, compression, . . . . .	16,000

Cast iron shall not be used for columns in buildings of more than seventy-five feet in height, nor in cases where the value of the length divided by least radius of gyration exceeds seventy.

Cast Iron Columns (centrally loaded and unsupported laterally).

Where the Length divided by the Least Radius of Gyration equals —	Average Stress per Square Inch of Section.	Where the Length divided by the Least Radius of Gyration equals —	Average Stress per Square Inch of Section.
10	11,000	50	9,800
20	10,700	60	9,500
30	10,400	70	9,200
40	10,000		

<sup>1</sup> These stresses (except for rivets) are for steel having an ultimate tensile strength of from fifty-five thousand to sixty-five thousand pounds per square inch, an elastic limit of not less than one half the ultimate strength, and a minimum percentage of elongation in eight inches of one million four hundred thousand, divided by the ultimate strength.

## (d) STONE WORK, IN COMPRESSION.

*Stresses in Tons of Two Thousand Pounds per Square Foot.*

First quality dressed beds and builds, laid solid in mortar of one part Portland cement to three parts sand, or one part natural cement to two parts sand.

Granite, . . . . .	60
Marble and limestone, . . . . .	40
Sandstone, . . . . .	30

In cases where poorer mortar is used, to avoid stain from cement, stresses shall be less than above, and must be approved by the building commissioner.

## (e) BRICKWORK IN COMPRESSION.

*Stresses in Tons of Two Thousand Pounds per Square Foot.*

(1.) For first class work of hard-burned bricks, including piers in which the height does not exceed six times the least dimension, laid in:—

(a) One part Portland cement, three parts sand, by volume, dry, . . . . .	20
(b) One part natural cement, two parts sand, by volume, dry, . . . . .	18
(c) One part natural cement, one part lime and six parts sand, by volume, dry, . . . . .	12
(d) Lime mortar, one part lime, six parts sand, by volume, dry, . . . . .	8

(2.) For brick piers of hard-burned bricks, in which the height is from six to twelve times the least dimension:—

Mortar (a), . . . . .	18
Mortar (b), . . . . .	15
Mortar (c), . . . . .	10
Mortar (d), . . . . .	7

(3.) For brickwork made of "light-hard" bricks, the stresses shall not exceed two thirds of the stresses for like work of hard-burned bricks.

## (f) CONCRETE.

When the structural use of concrete is proposed, a specification, stating the quality of proportions and materials, and the methods of mixing the same, shall be submitted to the building commissioner, who may issue a permit at his discretion and under such further conditions, in addition to those stated below, as he sees fit to impose.

A. In first class Portland cement concrete, containing one part cement to not more than six parts mixed properly graded aggregate, except in piers or columns of which the height exceeds six times the least dimension, the compressive stress shall not exceed thirty tons of two thousand pounds per square foot.

B. In piers and columns of first class Portland cement concrete, containing one part cement to not more than five parts mixed properly graded aggregate, where the height of the pier or column is more than six times and does not exceed twelve times its least dimension, the compressive stress shall not exceed twenty-five tons of two thousand pounds per square foot.

By "aggregate" shall be understood all the materials in the concrete except the cement. Cinders concrete shall be used constructively only for floors, roofs, and for filling.

Rules for the computation of reinforced concrete columns may be formulated from time to time by the building commissioner with the approval of the board of appeal.

In reinforced concrete beams or slabs subjected to bending stresses, the entire tensile stress shall be assumed to be carried by the steel, which shall not be stressed above the limits allowed for this material. First class Portland cement concrete in such beams or slabs, containing one part cement to not more than five parts mixed properly graded aggregate, may be stressed in compression to not more than five hundred pounds per square inch. In case a richer concrete is used, this stress may be increased with the approval of the commissioner to not more than six hundred pounds per square inch.

In reinforced concrete the maximum shearing force upon the concrete, when uncombined with compression upon the same plane shall not exceed sixty pounds per square inch, unless the building commissioner with the consent of the board of appeal shall fix some other value.

If the imbedded steel has no mechanical bond with the concrete, its holding power shall not exceed the allowable shearing strength of the concrete.

## (g) IN GENERAL.

Under the prescribed loads, beams shall be so proportioned that the deflection shall not exceed one three hundred and sixtieth ( $\frac{1}{360}$ ) of the span.

Stresses for materials and forms of material, not herein mentioned, shall be determined by the building commissioner. Provision for wind bracing shall be made wherever it is necessary, and all buildings shall be constructed of sufficient strength to bear with safety the load intended to be placed thereon, in addition to the weight of the materials used in construction.

No cutting for piping or any other purpose shall be done which would reduce the strength of any part of the structure below what is required by the provisions of this act.

*Quality of Materials.*

SECT. 15. All materials shall be of such quality for the purposes for which they are to be used as to insure, in the judgment of the building commissioner, ample safety and security to life, limb and neighboring property. The building commissioner shall have power to reject all materials which in his opinion are unsuitable, and may require tests to be

made by the architect, engineer, builder or owner to determine the strength of the structural materials before or after they are incorporated in a building, and may require certified copies of results of tests made elsewhere from the architect, engineer, builder, owner or other interested persons.

Hollow cast iron columns, if used, shall be shown by measurements and tests satisfactory to the commissioner to be of practically uniform thickness, and free from blow holes.

#### MORTARS.

All mortars shall be made with such proportion of sand as will insure a proper degree of cohesion and tenacity, and secure thorough adhesion to the material with which they are used, and the building commissioner shall condemn all mortars not so made.

(a) Mortar below the level of water shall be no poorer than one part Portland cement and three parts sand;

(b) Mortar for first class buildings shall, for the lower half of their height, be no poorer than one part natural cement to two parts sand; and, for the upper half, no poorer than one part of natural cement, one half part of lime, and three parts of sand;

(c) Mortar for second class buildings and for such parts of third class buildings as are below the level of the sidewalk, shall be no poorer than one part of natural cement, one of lime, and four of sand;

(d) Mortar for third class buildings, above ground, shall be no poorer than one part lime and four parts sand.

The building commissioner may allow lime mortar in setting stone where cement will stain.

#### CONCRETE.

Concrete shall be used immediately after mixing; it shall not be placed in the work after it has begun to harden; and it shall be deposited in such manner and under such regulations as to secure a compact mass of the best quality for the proportions used. Forms shall remain until the concrete has hardened so as to be able to carry its load safely, and shall be removed without jar.

The commissioner may require an applicant for a permit for the structural use of concrete to have an inspector satisfactory to the commissioner at all times on the work while concrete is being mixed or deposited, and such inspector shall make daily reports to the commissioner on the progress of the work.

#### CEMENT.

Cement shall conform to the specifications of the American Association for Testing Materials, as modified from time to time by that association.

#### REINFORCED CONCRETE.

Reinforced concrete slabs, beams or girders, if rendered continuous over supports by being unbroken in section, shall be provided with proper metal reinforcement at the top over said supports and may be computed as continuous beams, as hereinafter described.

The modulus of elasticity of the concrete, if not shown by direct tests, may for beams and slabs be taken as one fifteenth that of steel, and for columns one tenth that of steel.

The reinforcing metal shall be covered by not less than three fourths inch of concrete in slabs, and by not less than one and one half inches of concrete in beams and columns.

#### METHODS OF COMPUTATION.

SECT. 16. Beams or girders of metal or reinforced concrete shall be considered as simply supported at their ends, except when they extend with unbroken cross-section over the supports, in which case they may be considered as continuous.

The span of a beam shall be considered as the distance from centre to centre of the bed plates or surfaces upon which it rests. If it is fastened to the side of a column, the span shall be measured to the centre of the column.

In slabs, beams or girders continuous over supports, provision shall be made for a negative bending moment at such supports equal to four fifths of the positive bending moment that would exist at the centre of the span if the piece were simply supported; and the positive bending moment at the centre of the span may be taken equal to the negative bending moment at the support.

In the case of a slab of reinforced concrete with parallel ribs or girders beneath, the rib or girder may be considered to include a portion of the slab between the ribs, forming a T-beam. The width of the T-beam on top shall not exceed one third the span of the rib nor the distance from centre to centre of the ribs.

Reinforced concrete columns shall be proportioned on the assumption that the concrete and the steel are shortened in length in the same proportion. The steel members shall be tied together at intervals sufficiently short to prevent buckling.

If a column is loaded excentrically or transversely, the maximum fibre stress, taking account of the direct compression, the bending which it causes, its excentricity and the transverse load, shall not exceed the maximum allowable stress in compression.

If a tension piece is loaded excentrically or transversely, the maximum fibre stress, taking account of the direct tension, its excentricity and the transverse load, shall not exceed the maximum allowable stress in tension.

An excentric load upon a column shall be considered to affect excentrically only the length of column extending to the next point below at which the column is held securely in the direction of the excentricity.

If a piece is exposed to tension and compression at different times, it shall be proportioned to resist the maximum of each kind, but the unit stresses shall be less than those used for stress of one kind, depending upon the ratio and the relative frequency of the two maxima.

Net sections shall be used in proportioning steel tension members, and in deducting rivet holes they shall be taken as one eighth of an inch greater in diameter than the rivets.



The length of a steel compression member between supports in any direction shall not exceed one hundred and twenty times its radius of gyration about an axis perpendicular to that direction.

The webs of plate girders shall be proportioned to resist buckling in cases where they are not supported laterally, according to the formula:—

$$1 + \frac{.1}{3,000} \frac{d^2}{t^2}$$

in which  $t$  = thickness of web, in inches;  $d$  = clear, unsupported dimension horizontally or vertically, whichever is the lesser.

In proportioning the flanges of plate girders, one eighth of the gross area of the web may be considered as available in each flange. If the length of the top flange unsupported laterally exceeds twenty times its width, the allowable stress shall be reduced, as in the case of rolled beams.

Pins shall be computed by assuming the forces in the bars to act at the centre of the bearing areas.

In riveted trusses the centre of gravity lines of members coming together at a joint shall, if possible, intersect at a point. Eccentricity due to a non-fulfilment of this rule shall be allowed for in the computations. The centre of gravity of the rivets connecting one piece to another shall, in general, lie as nearly as practicable in the centre of gravity line of the piece.

#### CLASSIFICATION.

##### *First and Second Class Buildings.*

SECT. 17. Every building over seventy-five feet in height hereafter erected or raised and every house adapted for habitation more than five stories in height and exceeding sixty-five feet above the basement or covering more than five thousand superficial square feet on the ground floor, regardless of height, shall be constructed as a first class building and all other houses may, except as herein otherwise provided, be of second or third class construction.

New buildings adapted for habitations, and not more than five stories above the cellar or basement, may be erected of second class construction, but no such building shall exceed five thousand square feet in superficial area or sixty-five feet in height. The first story or basement, or both the first story and basement, in such buildings, so constructed, altered, remodelled or enlarged, may be used for mercantile purposes, provided, that the walls and ceilings surrounding the areas so used shall be fire-stopped to the satisfaction of the commissioner.

New buildings, of concrete, concrete blocks or brick, not over three stories in height, adapted for the occupancy of a single family and having a superficial area of not more than twelve hundred square feet, may be constructed with external and party or division walls of eight inches in thickness: *provided, however,* that where the party wall of a building thus constructed joins or becomes the party wall of another such building, the floor timbers in each of such buildings shall be so spaced or protected that their ends shall not approach nearer than within eight inches of each other.

##### *Restriction of Areas.*

Any first class building used above the first floor as a warehouse or store for the storage or sale of merchandise shall have all vertical openings protected by fireproof enclosures. Such enclosures shall, if enclosing stairs or escalators, have automatic doors, and all glass in said enclosure shall be wire glass.

Such buildings shall so be divided by brick walls built like party walls with the same openings allowed, that no space inside such buildings shall exceed in area ten thousand square feet, except that when any such building has a frontage of not less than fifty feet on each of two streets, such space may exceed ten thousand square feet in area, provided that buildings in which such extension of area beyond ten thousand square feet is permitted shall have automatic fire sprinklers installed, and means of ingress and egress satisfactory to the commissioner and the board of appeal.

Second class buildings used above the first floor as warehouses or stores for the storage or sale of merchandise shall so be divided by brick walls, built like party walls with the same openings allowed, that no space inside such buildings shall exceed in area ten thousand square feet, and no existing wall in any second class building shall be removed so as to leave an area of more than ten thousand square feet, nor shall any existing wall, separating areas which combined would exceed ten thousand square feet in area, have openings cut in it greater in area or number than is allowed by this act for party walls.

Every second class building more than three stories high and used above the first floor as a warehouse or store for the storage or sale of merchandise shall have all vertical openings for elevators and stairways, air or light shafts, through its floors protected by fireproof enclosures. Such enclosures shall be supported on fireproof supports and framing, and shall, if enclosing stairs or escalators, have automatic doors, and all glass in said enclosures shall be wire glass.

No building used above the first floor for the storage or sale of merchandise shall have less than two means of egress from every story, one of which means may be either an outside fire escape or through a brick wall closed by automatic doors into a building of the same class; except that an independent monumental stairway extending from the basement to the second floor may be constructed.

##### *Buildings for Manufacturing Purposes.*

Buildings outside the building limits and adapted exclusively for manufacturing, storage, mechanical or stable purposes, may be built under such conditions as the commissioner shall prescribe. If of wood such buildings shall not exceed forty-five feet in height.

#### CONSTRUCTION.

##### *Height.*

SECT. 18. No building, structure or part thereof shall be of a height exceeding two and one half times the width of the widest street on which the building or structure stands, whether such street is a public street or place or a private

way, nor exceeding one hundred and twenty-five feet in any case. The width of such street, place or private way shall be measured from the face of the building or structure to the line of the street on the other side. If the street is of uneven width, the width shall be the average width of the part of the street opposite the building or structure; if the effective width of the street is increased by an area or setback, the space between the face of the main building and the lawfully established line of the street may be built upon to the height of two and one half times the width of the street.

All buildings or structures hereafter erected in any part of the city shall be subject to the restrictions imposed by chapter four hundred and fifty-two of the acts of the year eighteen hundred and ninety-eight, by chapter five hundred and forty-three of the acts of the year nineteen hundred and two, by chapter three hundred and eighty-three of the acts of the year nineteen hundred and five, and by chapter four hundred and sixteen of the acts of the year nineteen hundred and seven, so far as the restrictions imposed by said acts relate to the districts described therein; and shall also be subject to any restrictions lawfully imposed by the park commissioners of said city.\*

#### *Excavations.*

SECT. 19. All excavations shall so be protected, by sheet piling if necessary, by the persons causing the same to be made, that the adjoining soil shall not cave in by reason of its own weight. It shall be the duty of the owner of every building to furnish, or cause to be furnished, such support that his building shall not be endangered by any excavation: *provided*, that the owner of any building which is endangered by an excavation carried by an adjoining owner more than ten feet below the grade of the street may recover the expense so caused of supporting such building from the persons causing such excavation to be made. All permanent excavations shall be protected by retaining walls. In case of any failure to comply with the provisions of this section the commissioner may enter upon the premises and may furnish such support as the circumstances may require. Any expense so incurred may be recovered by the city from the persons required by law to furnish the support.

#### *Piling.*

SECT. 20. All buildings shall, if the commissioner determines that piling is necessary, be constructed on foundation piles which, if of wood, shall be not more than three feet apart on centres in the direction of the wall, and the number diameter and bearing of such piles shall be sufficient to support the superstructure proposed. The commissioner shall determine the grade at which the piles shall be cut. The commissioner may require any applicant for a permit to ascertain by boring the nature of the ground on which he proposes to build, and he may require an inspector satisfactory to the commissioner to be at all times on the work while piles are being driven, who shall keep an accurate record of the length of each pile, the weight and fall of the hammer, and the penetration of each pile for each of the last two blows of the hammer.

Plain concrete piles shall be made in place by methods which are reasonably certain to secure perfect, full sized piles. Reinforced concrete piles if properly designed to resist the shock of driving, and if driven with a cushion to lessen the shock or by a water jet, may be molded, allowed to harden, and then driven in place.

In case concrete piles are used, whether reinforced or not, their bearing power shall be determined by putting in one or more test piles and loading them after the concrete has hardened. The load allowed shall not be more than one half the load under which the pile begins to settle. In no case, however, shall the load on a concrete pile exceed that specified herein for concrete in columns. Concrete for piles shall have not more than five parts of properly made and mixed aggregate to one part of Portland cement; and the aggregate shall all be capable of passing through a one inch ring.

All wood piles shall be capped with block granite levellers, each leveller having a firm bearing on the pile or piles which it covers, or with first class Portland cement concrete, not less than sixteen inches thick, above the pile caps, containing one part of cement to not more than six parts of properly graded aggregate of stone and sand, the concrete to be filled in around the pile heads upon the intervening earth.

#### *Foundations of First and Second Class Buildings.*

SECT. 21. Foundations of first and second class buildings may be of brick, stone or concrete. The thickness shall be as stated in section twenty-three. Foundations of rubble stone shall be allowed only under buildings less than forty-five feet in height and for a depth of less than ten feet.

The walls and piers of every building shall have a foundation, the bearing of which shall be not less than four feet below any adjoining surface exposed to the frost, and such foundation, with the superstructure which it supports, shall not overload the material on which it rests.

#### *Cellars.*

SECT. 22. The cellar of every building, where the grade or nature of the ground so requires, shall be sufficiently protected from water and damp by a bed at least two inches thick over the whole, of concrete, cement and gravel, tar and gravel, or asphalt, or by bricks laid in cement. No cellar or basement floor of any building shall be constructed below the grade of twelve feet above mean low water, unless such cellar is made waterproof to the satisfaction of the commissioner. All metal foundations and all constructional metal work underground shall be protected from dampness by concrete, or by other material approved by the commissioner.

#### *Thickness of Walls.*

SECT. 23. Except as provided in section seventeen, the external walls above the foundation of houses for habitation of first or second class construction, and not exceeding sixteen hundred square feet in area and not over three stories high, shall be not less than eight inches thick for external walls and not less than twelve inches thick for party walls. In case any part of such building is adapted for any use other than habitation, all walls shall be not less than twelve inches thick. All other houses for habitation, not exceeding five thousand feet in superficial area and not exceeding five stories or sixty-five feet in height, above the basement, shall have all walls not less than twelve inches thick.

\* See page 33 for titles of chapters mentioned.

The external and party walls of every building of the first or second class, except houses for habitation, less than sixty-five feet in height shall be twelve inches thick in the upper two stories not exceeding twenty-five feet in height. In the section of two stories, but not exceeding twenty-five feet next below, the walls shall be sixteen inches thick. In the next lower section of three stories, but not exceeding thirty-seven feet, the walls shall be twenty inches thick, and in each succeeding section of three stories, but not exceeding thirty-seven feet or any part thereof, the walls shall be four inches thicker than the section next above it. The foundation walls shall be at least four inches thicker than the required thickness of the walls of the first story. The thickness herein given shall apply to all masonry walls unless they are reinforced by a frame or skeleton of steel.

In reckoning the thickness of walls, ashlar shall not be included unless the walls are at least sixteen inches thick and the ashlar is at least eight inches thick, or unless alternate courses are at least four and eight inches to allow bonding with the backing. Ashlar shall be properly held by metal clamps to the backing or properly bonded to the same.

#### *Anchors.*

SECT. 24. All walls of a first or second class building meeting at an angle shall be securely bonded, or shall be united every five feet of their height by anchors made of at least two inches by half an inch of steel or wrought iron, well painted, and securely built into the side or partition walls not less than thirty-six inches, and into the front and rear walls at least one half the thickness of such walls.

#### *Brickwork — Bonding.*

SECT. 25. Every eighth course, at least, of a brick wall shall be a full heading or bonding course, except where walls are faced with face brick, in which case in every eighth course at least every other brick shall be a full header. No diagonal header ties shall be used.

#### *Vaulted Walls.*

SECT. 26. If the air spaces are headed over and the walls are built solid for at least three courses below the floor and roof beams, walls, if of brick, may be built hollow. They shall contain, exclusive of wibes, the same amount of material as is required for solid walls, and the masonry on the inside of the air space in walls over two stories in height shall be not less than eight inches thick, and the parts on either side shall be securely tied together with ties not more than two feet apart in each direction.

#### *Walls Framed with Iron or Steel.*

SECT. 27. Walls may be built in part of iron or steel or with a reinforced concrete or metal framework. In such metal framework the beams and girders shall be riveted to each other at their respective junction points. If columns made of rolled iron or steel are used, their different parts shall be riveted to each other, and the beams and girders resting upon them shall, if possible, have riveted connections to unite them with the columns. If cast iron columns are used, each successive column shall be bolted to the one below it by at least four bolts not less than three fourths of an inch in diameter, and the beams and girders shall be bolted to the columns. At each line of floor or roof beams, lateral connections between the ends of the beams and girders shall be made in such manner as rigidly to connect the beams and girders with each other in the direction of their length.

All party walls of skeleton construction shall have curtain walls of brick, not less than twelve inches thick.

All outside walls of skeleton construction shall have curtain walls which may be of masonry, terra-cotta, concrete, or reinforced concrete, constructed and supported under such conditions as the commissioner shall prescribe.

If the metal or other framework is so designed that the enclosing walls do not carry the weight of floors or roof, then the walls shall be of masonry or concrete construction and shall be thoroughly anchored to the iron skeleton, and whenever the weight of such walls rests upon beams or columns, such beams or columns shall be made strong enough in each story to carry the weight of wall resting upon them without reliance upon the walls below them.

#### *Party Walls Above Roof.*

SECT. 28. In buildings less than forty-five feet in height all party walls shall be built to a height at least twelve inches above the roof covering, and shall be capped with stone, cement or metal securely fastened to the masonry. In all other buildings such walls shall be carried thirty inches above the roof.

#### *Walls — Cornices.*

SECT. 29. Where a wall is finished with a stone cornice, the greatest weight of material of such cornice shall be on the inside of the face of the wall. All cornices of second class buildings shall be of brick or covered with fireproof material, and the walls shall be carried up to the boarding of the roof; and where the cornice projects above the roof the masonry shall be carried up to the top of the cornice and covered with metal, like parapet walls.

#### *Piers and Hearths.*

SECT. 30. Piers and walls shall have caps or plates, where they are needed, sufficient properly to distribute the load. Hearths shall be supported by trimmer arches of brick or stone; or shall be of single stones at least six inches thick, built into the chimney and supported by iron beams, one end of which shall be securely built into the masonry of a chimney or of an adjoining wall, or which shall otherwise rest upon an incombustible support. Brick jambs of every fireplace, range or grate opening shall be at least eight inches wide each, and the backs of such openings shall be at least eight inches thick. Hearths and trimmer arches shall be at least twelve inches longer on either side than the width of such openings, and at least eighteen inches wide in front of the chimney breast. Brickwork over fireplaces and grate openings shall be supported by proper iron bars, or brick or stone arches.

#### *Walls — Doorways in Party Walls.*

SECT. 31. Openings for doorways in party walls shall not exceed one hundred square feet in area, and each open-

ing shall have two sets of fire doors separated by the thickness of the wall, hung in a manner satisfactory to the commissioner, except that the aggregate width of all openings in any story shall not exceed fifty per cent of the length of the wall in which such openings occur. Openings, not exceeding one hundred and forty-four square inches, constructed and protected as shall be approved by a writing signed by the fire commissioner, and filed with the commissioner, may be permitted in any wall or floor.

#### *Fire Protection.*

SECT. 32. All structural metal supporting or forming part of the frame, floors, roof or columns of any building, except as otherwise exempted in this act, shall be protected against the effect of heat.

This protection shall consist of concrete, or of porous terra-cotta or brick set in cement mortar. When block construction is used, it shall be clamped in place with steel clamps, or wrapped securely with number twelve galvanized-iron wire or metal lathing in such manner as to hold each block in place, and shall be plastered with lime or other mortar at least three fourths of an inch thick in addition to the protection.

The protection on all floor and roof beams shall be at least one inch thick, on all floor and roof girders and on all beams carrying masonry at least one inch thick on top and two inches thick elsewhere, on all columns carrying only floors three inches, and on all columns built into or carrying walls four inches.

If terra-cotta blocks are used for protection, such blocks may be hollow, but each face shall be solid, and no flange shall be less than one inch thick.

Plaster on wire or metal lath shall not be considered as a fire protection for steel or iron structural members, but may be used with an air space under arches as a suspended ceiling, provided that such arches have at least one inch of thickness of fireproofing under the flanges in addition to such ceiling, and that the metal lath and plaster are suspended separately from the arches and are not less than one inch below the same.

All protection shall be applied directly to the metal work and shall not be broken into nor interrupted by any pipes, wires, chases or conduits of any kind.

About isolated columns on the exterior of buildings, the thickness of protection may be reduced to one inch, when the same is covered with an outer shell of cast iron or steel.

When a column or girder is formed of built-up shapes, the spaces between flanges shall be filled solid with protecting material, but this protection need not extend more than one inch beyond the edges of projecting angles, bars or channels. The protection shall cover all lugs, brackets, braces, etc.

The metal work of all trusses carrying masonry or floor loads shall be protected, as hereinbefore described, but said provisions shall not apply to trusses which carry roof load only.

When a wall or partition is formed with a framework of angles, channels, or other built-up shapes, and such wall or partition is filled in flush with both faces of the frame with terra-cotta blocks, additional protection may be omitted.

The above requirements as to fireproofing shall not apply to iron or steel in second or third class buildings in any case in which the use of wood without fire protection would be permissible under this act.

In work in connection with alterations of existing buildings, the character and amount of protection for steel and ironwork shall be made satisfactory to the commissioner.

In positions where the protection of isolated or exposed columns is likely to be broken or damaged by trucks or merchandise, there shall be outside of the protection a guard at least five feet high of iron or wood, bound with wire or steel so as to be self-supporting.

Spaces between and behind all studding or furring shall be filled solid with bricks and mortar or other fireproof material for a space of five inches in height above the floor beams or plaster grounds. Spaces between the strap furring on brick walls shall be filled solid with mortar for five inches below the bottom of the floor beams. The spaces between stringers of stair and joists of landings, unless unceiled or of fireproof construction, shall be stopped solid with wood, brick or terra-cotta or other approved material as often as twice in each flight of stairs. The spaces between floor beams on bearing partitions shall be stopped in a similar manner.

In every building of second or third class construction each floor shall be thoroughly stopped by a continuous layer of asbestos fabric, magnesio calcite or other fire-resisting material approved by the commissioner.

The tops of all heating furnaces and smokepipes shall be at least one foot below the nearest wooden beams or ceiling. All ceilings immediately over a furnace or boiler, and for six feet on each side thereof, and all ceilings over indirect radiators shall, except under fireproof floors, be metal lathed and plastered.

All hot-air register boxes in the floors or partitions of buildings shall be set in soapstone or equally fireproof borders not less than two inches in width, shall be made of tin plate, and shall have double pipes and boxes properly fitted to the soapstone. Hot-air pipes and register boxes shall be at least one inch from any woodwork, and register boxes shall be fifteen inches by twenty-five inches, or larger, and their connecting pipes shall be two inches from any woodwork. If indirect hot water or indirect steam is used, the commissioner may modify or dispense with the foregoing requirements.

#### *Fireproof Partitions.*

SECT. 33. Partitions in buildings of first class construction shall be constructed of plastering applied to metal lathing, or to plaster boards, or to hollow blocks composed of cement, plaster, or terra-cotta. When block construction is used it shall be self-supporting above all openings, thoroughly bonded and set in Portland cement. The blocks shall start from the floor and shall be continuous to the floor above, except that in the upper story, where there is a space between the ceiling of the top story and the roof, these partitions need not extend above the ceiling. If plastered on both sides the blocks shall be not less than four inches thick up to a height of fifteen feet, and shall be increased one inch for every additional eight feet or fraction thereof. The thickness of webs shall be not less than three fourths of an inch.

If partitions are not plastered on both sides, the thickness of blocks shall be one inch greater than as specified above.

#### *Timbers in Walls of Second Class Buildings.*

SECT. 34. The ends of all wooden floor or roof beams in second class buildings shall enter the wall to a depth of at

least four inches. When the wall is eight inches thick it shall be corbelled or the beams shall be hung in metal hangers; and the ends of all such beams shall so be shaped or arranged that in case of fire they may fall without injury to the wall.

#### *Alteration of Existing Buildings.*

SECT. 35. Any building, except those of third class construction within the building limits, having not more than five floors above the mean grade of all the sidewalks, may be altered, remodelled or enlarged for use as a house for habitation using second class construction.

The first story or basement, or both the first story and basement, in such buildings may be used for mercantile purposes, provided that the walls and ceilings surrounding the area so used shall be fire-stopped to the satisfaction of the commissioner.

The height of any such building shall not be increased unless the walls and foundations conform to the provisions of this act. The number of stories of such a building shall not exceed five above the cellar or basement.

Every such building, more than thirty-three feet in height, so altered, remodelled or enlarged, shall be provided with at least two independent exits satisfactory to the commissioner.

Every such building, so altered, remodelled or enlarged, shall have, in addition to the exposure on the widest street, an exposure as long as the average width of the building, upon a space open from the ground to the sky, at least ten feet wide for the first three stories, and increasing in width five feet for the next two stories. If the proposed building is more than five stories in height, said space shall be twenty feet: *provided*, that if the basement and first story are adapted or enlarged for use for mercantile purposes, the exposure required by this section shall not apply to that part of the building; and *provided, also*, that sufficient space be retained on the lot for the storage of ashes and garbage.

Such exposure may be either upon private or public ways, or upon land which is dedicated for the use of the building, and may be divided and placed as approved by the building commissioner.

These spaces shall remain undiminished so long as the building is used for habitation.

If the building is situated on the corner of streets or private ways not less than ten feet wide the commissioner may approve the omission of the whole or part of this additional exposure.

If in the opinion of the commissioner the alteration proposed to be made in a building is of such extent as, when done, to produce a practically new structure or to impair the stability or increase the fire risk of the structure as a whole, then the whole structure shall be made to conform to the provisions of this act for a new structure of the same class. A building damaged by fire or other casualty may be repaired or restored so as to conform to its original condition, or may be reconstructed in some or all of its parts, so as to conform to the requirements of this act for new buildings, as the commissioner may specify in his permit.

Every living room in a building adapted for habitation shall have a window on the open air of an area not less than ten square feet and distant in a three story building not less than six feet from any opposite wall; distant in a four story building not less than eight feet from any opposite wall; distant in a five story building not less than ten feet from any opposite wall. This shall not apply to the construction of third class buildings, except the provision for a window on the open air of an area.

The exposure required under this section shall apply to all buildings hereafter constructed adapted for habitation, except as is otherwise provided for tenement houses.

#### *Floors — Loads.*

SECT. 36. All new or renewed floors and stairs shall be so constructed as to carry safely the weight to which the proposed use of the building may subject them, and every permit granted shall state for what purpose the building is designed to be used; but the least capacity per superficial square foot, exclusive of materials, shall be:—

For floors of houses for habitation, fifty pounds.

For office floors and for public rooms of hotels and houses exceeding five hundred square feet, one hundred pounds.

For floors of retail stores and public buildings, except schoolhouses, or for light manufacturing, one hundred and twenty-five pounds.

For floors of schoolhouses, other than floors of assembly rooms, sixty pounds, and for floors of assembly rooms, one hundred and twenty-five pounds.

For floors of drill rooms, dance halls and riding schools, two hundred pounds.

For floors of warehouses and mercantile buildings, at least two hundred and fifty pounds.

For flat roofs, forty pounds.

For stairs, landings, platforms and fire escapes, seventy pounds.

The loads not included in this classification shall be determined by the commissioner.

The full floor load specified in this section shall be included in proportioning all parts of buildings designed for warehouses, or for heavy mercantile and manufacturing purposes. In other buildings, however, reductions may be allowed, as follows: for girders carrying more than one hundred square feet of floor, the live load may be reduced ten per cent. For columns, piers, walls and other parts carrying two floors, a reduction of fifteen per cent of the total live load may be made; where three floors are carried, the total live load may be reduced by twenty per cent; four floors, twenty-five per cent; five floors, thirty per cent; six floors, thirty-five per cent; seven floors, forty per cent; eight floors, forty-five per cent; nine or more floors, fifty per cent.

The commissioner may prescribe the maximum loads which may be imposed upon the floors of existing buildings.

#### *Shutters.*

SECT. 37. In all first or second class mercantile or manufacturing buildings over thirty feet in height, outside openings in party walls, or in any rear or side wall within twenty feet of an opposite wall or building, shall have metal frames and sashes and shall be glazed with wire glass or shall be protected by shutters. Such shutters shall be covered on both sides with tin or shall be made of other substantial fireproof material, and hung on the outside, either upon inde-



pendent metal frames or upon metal hinges attached to the masonry, and shall be made to be handled from the outside, and one such shutter in each room shall have a protected hand-hole eight inches in diameter.

#### *Elevators.*

SECT. 38. Elevators and hoists for freight which do not run above the first story may be constructed without fireproof enclosures. Freight and passenger elevators may be placed in areas or hallways where the same are continuous and unbroken, such elevators to be protected by metal grille. Except as above provided, all shafts for elevators, hoists, dumb-waiters, lifts, light and ventilating shafts or other air ducts shall be constructed of fireproof material. The tops of all such shafts shall be covered with fireproof material unless the shaft extends above the upper floor of the building, and in that case the shaft shall be carried at least three feet above the roof and shall be covered with a skylight. Such shafts, if for freight or passenger elevators, shall be of brick at least eight inches thick, or of metal covered on both sides with at least one inch of plaster applied immediately to the metal, or with some other equally substantial fireproof material.

Every opening into a shaft or hoistway shall be protected by self-closing gates, rails, trap-doors, or other equivalent devices.

Every elevator shall be provided with a safety attachment to prevent the falling of the car. The machinery over the elevator shall have underneath it a grille sufficient to protect the car from falling material.

Every opening into an elevator shaft or hoistway and every opening through a floor, other than a stairway, shall be closed when not in use.

All elevator shaft openings, other than openings into passenger elevator shafts, shall be furnished with metal-covered or incombustible doors, hung in a manner satisfactory to the commissioner, and shall be provided with iron thresholds. Wire glass panels may be used in such doors. Outside windows or openings of every elevator shaft shall have three vertical iron rods, painted red, equally spaced off in such window or opening.

Freight elevators shall be equipped with a suitable danger signal to warn people of the approach of the elevator.

The space between the car and door of each landing shall be not more than two inches.

No elevator shall be used in any building until the same is approved in writing by the commissioner.

In case any freight or passenger elevator is not constructed or furnished in compliance with this act, or has become unsafe, the commissioner shall post a conspicuous warning and prohibition at each entrance to such elevator. It shall thereafter, until a new written permit is given by the commissioner, be a penal offence hereunder to operate the said elevator, or to remove or deface the said notice.

Freight elevator wells hereafter built on the line of the external wall of a building shall be so constructed that there shall be no recess in the outer wall along the whole line of the same, and that no more than four inches space shall be allowed between the platform of the car and the outer wall. The side of the platform and the line of the doorway shall be flush with the well-way, and the door openings from the said elevator well into the building shall be placed at least six inches back from the face of the well, so as to allow space enough for self-closing gates to operate between the door and the well opening. Outside openings for freight elevators shall be protected by self-closing slatted gates, "vertical," with spaces not wider than two inches between the slats.

All elevators running at a speed of more than one hundred feet a minute, shall be operated by competent persons not less than eighteen years of age, and no other person shall operate or have the care or charge of such an elevator.

No elevator shall be operated by or placed in charge of any person under sixteen years of age.

No elevator shall hereafter be installed in any building without a permit having been granted therefor, and the applicant shall submit a plan showing the proposed location of the shaftway, the area and situation of the machine room, and the said plan shall be filed as part of the records of the department. All elevators hereafter installed shall be located so as to give easy and safe access to all the principal parts of the machinery for inspection and repairs.

All passenger elevators hereafter built operated by drum and cables, shall have an overspeed governor to prevent the car from descending at overspeed, and all passenger and freight elevators shall have a slack cable device to stop the machinery in case the car is held up or the cables part.

If any accident shall occur to any elevator affecting life or limb or damaging any part of the machinery or running parts of the elevator, it shall be the duty of the engineer or superintendent in charge immediately, before any repairs are made, or any broken pieces are removed, to notify the commissioner of the accident, before the elevator is operated again, so that the cause of the accident may be determined, any faulty construction remedied, and satisfactory repairs made.

All elevator cables hereafter installed that pass through bevelled sockets, the ends returning and refitting into the same, shall have in addition lead or babbitt metal poured into the ends of the socket, to prevent the possibility of the cable's slipping.

All manufacturers of elevators shall be required to test, in the presence of an inspector, the safety devices of every elevator installed before the same is turned over to the owners for use, and the commissioner shall be notified by the manufacturer at least twenty-four hours before such test is made. An inspector may require a test of the safety device of any elevator if in his judgment the same is required.

The commissioner may require additional safeguards on elevators, if in his judgment the condition, use or surroundings of the elevator demand them.

The commissioner may, with the approval of the mayor, appoint competent elevator inspectors in addition to those already detailed, one for every one thousand elevators and hoistways in the city of Boston.

#### *Wooden Buildings.*

SECT. 39. Every wooden building hereafter erected shall have a foundation of concrete, rubble, block granite or brick, laid in mortar or other equally substantial material, carried to the surface of the ground. Every such foundation if of brick or concrete, shall be at least twelve inches thick; if of granite, shall be at least sixteen inches thick; if of rubble, shall be at least twenty inches thick; and shall be laid at least four feet below any surface exposed to frost and upon solid ground or upon piles properly spaced.

Every wooden building hereafter erected or altered, the sills of which do not rest directly upon a foundation as above described, but on an underpinning, shall have such underpinning made of brick, stone or concrete; and if the building is thirty-three feet or less in height above the highest street level of its principal front, the underpinning, if of brick or concrete, shall be at least eight inches thick, and if the building is of greater height, the underpinning, if of brick or concrete, shall be at least twelve inches thick; every underpinning of stone shall be at least sixteen inches thick. Every wooden building, hereafter erected on soft and marshy land, and used for a workshop or other like purpose, or as a temporary structure, may, if the commissioner approves, rest upon mud sills or blocks, or on piles.

Every wooden building hereafter erected or altered shall have all its parts of sufficient strength to carry the weight of the superstructure; shall be built with sills, posts, girts, studs and plates, properly framed, mortised, tenoned, braced and pinned in each story, or with a balloon frame; the posts and girts shall be not less than four by six inches in cross section, and the studs shall be not more than twenty inches apart. Wooden buildings hereafter erected for other purposes than habitation shall not be situated within five feet of the line of the lot unless the side wall on such line or lines be of brick or concrete, built to the under side of the roof.

SECT. 40. No wooden building hereafter erected to be used as a habitation shall be more than three stories in height above the basement, nor more than forty-five feet in height above the street level, nor shall any part of such building, except the eaves and cornice, be nearer than three feet to the line of any adjoining lot, and if built on land of the same owner, nearer than six feet to any other building, unless the side wall of such adjoining building is constructed as a solid brick or concrete wall not less than eight inches thick and carried twelve inches above the roof.

Every wooden building hereafter constructed to form a block of two or more houses shall have a brick or concrete party wall between adjoining houses, which shall be not less than eight inches thick, shall be carried twelve inches above the roof, and shall be capped with a metallic covering.

#### *Flooring during Construction.*

SECT. 41. If, in the erection of an iron or steel frame building, the spaces between the girders or floor beams of a floor are not filled and covered by the permanent construction of such floors before another story is added to the building, a close plank flooring shall be placed and maintained over such spaces during construction. If and when such flooring cannot be used without serious interference with the work of construction, such provision shall be made to protect the workmen from falling materials as will be satisfactory to the commissioner.

#### ADDITIONAL REQUIREMENTS FOR TENEMENT HOUSES.

##### *Definitions.*

SECT. 42. Certain words are defined as follows: —

(1.) A tenement house is any house, building, structure or portion thereof, occupied, or adapted for occupation, as a dwelling by more than three families living independently of one another and doing their cooking upon the premises, or by more than two families above the first story so living and cooking. A family living in a tenement house may consist of one or more persons.

An existing tenement house is any building erected as such or converted to such use or as altered for such use or so used before the passage of this act, and any building adapted for such use, provided that a permit was issued for the erection of said building before the passage of this act.

A tenement house hereafter erected is any tenement house other than an existing tenement house as above defined. "

(2.) A corner lot is a lot situated at the junction of two or more streets, or of two or more streets and alleys or open passageways not less than fifteen feet in width.

(3.) A yard is an open unoccupied space on the same lot with a building and between the extreme rear line of said building and the rear line of the lot.

(4.) A court is an open unoccupied space other than a yard on the same lot with a building. An inner court is a court not extending to a street, or alley, or open passageway, or yard. An outer court is a court extending to a street, or alley, or open passageway, or yard. A vent court is an inner court for the lighting and ventilation of water-closets, bathrooms, public halls, and stair halls only. An intake is a passageway connecting an inner court with a street, or alley, or open passageway, or yard.

(5.) A shaft, whether for air, light, elevator, dumb-waiter, or any other purpose, is an enclosed space within a building, extending to the roof, and covered either by a skylight or by the roof. A vent shaft is a shaft used solely to ventilate or light water-closet compartments or bathrooms.

(6.) A public hall is a hall, corridor, or passageway not within an apartment.

(7.) A stair hall includes the stairs, stair landings, and those parts of the public hall through which it is necessary to pass in going from the entrance floor to the roof.

(8.) An apartment is a room, or suite of two or more rooms, occupied or suitable for occupation, as a residence for one family.

(9.) Repairs means any renewal of any existing part of a building, or of its fixtures or appurtenances, which does not lessen the strength of the building.

#### *Fire-escapes.*

SECT. 43. In all tenement houses hereafter erected and more than three stories in height above the basement or cellar there shall be provided one of the following means of egress for escape from fire: (1) an interior enclosed stairway as described in this section; or (2) an exterior iron fire-escape and stairs as hereinafter described; or (3) iron balconies connecting with adjoining houses, or with adjoining parts of the same house separated from each other by a brick partition wall in which there are no openings except such as are protected with fireproof self-closing doors; and every apartment above the first floor shall have access to one of such means of egress.

(1.) Interior fire-escapes may consist of wooden circular stairs, occupying a space of a diameter not less than four feet six inches. Such stairs shall extend from the top floor to the level of the basement, where they shall open into either an outer or an inner court or yard. These stairs shall be separated in the basement from the basement by brick walls at least eight inches thick, and the stairs above the basement shall be enclosed with fireproof partitions clear to a vent skylight, and shall have on each floor, in a public hall accessible from each apartment, a fireproof self-closing door and fireproof frame; the door to open into the corridor, and to be so arranged that it cannot be opened from the stair side; such staircase to be provided with a ventilating skylight at least nine square feet in area. The soffits of the stars, if they are of wood, shall be plastered on metal lathing.

(2.) Exterior fire-escapes shall be of iron, with iron grated floor, and capable of bearing a load of seventy pounds per square foot. The stair treads shall be of iron, and the pitch of the stairs shall not exceed sixty degrees.

Balconies shall be at least three feet four inches wide, and the stairs at least twenty inches. There shall be a landing at the foot of each flight, and at the level of the second floor there shall be cantilever ladders. The rails on horizontal balconies and on the stairs shall be at least two feet ten inches high at all points.

(3.) Balconies connecting adjoining houses, or adjoining parts of the same house as described above, shall be not less than thirty inches wide and capable of sustaining a load of seventy pounds per square foot. Railings shall be not less than two feet ten inches high, and shall be of iron.

#### *Bulkheads and Scuttles.*

SECT. 44. Every tenement house of the first or second class hereafter erected shall have in the roof a fireproof bulkhead with a fireproof door to the same, and shall have fireproof stairs with a guide or hand rail leading to the roof, except that in such tenement houses which do not exceed sixty-five feet in height, such bulkheads may be of wood covered with metal on the outside and plastered on metal lathing on the inside; provided that the door shall be covered with metal on both sides.

Every other tenement house shall have in the roof a bulkhead or scuttle. No scuttle shall be less in size than two feet by three feet, and all scuttles shall be covered on the outside with metal, and shall be provided with stairs or stationary ladders leading thereto and easily accessible to all tenants of the building, and kept free from encumbrance, and all scuttles and ladders shall be kept so as to be ready for use at all times. No scuttle shall be situated in a closet or room, but all scuttles shall be in the ceiling of the public hall on the top floor, and access through the scuttle to the roof shall be direct and uninterrupted. Scuttles shall be hinged so as to readily open. Every bulkhead hereafter constructed in a tenement house shall be constructed as provided for tenement houses hereafter erected and shall have stairs with a guide or hand rail leading to the roof, and such stairs shall be kept free from encumbrance at all times. No lock shall be placed on any scuttle or bulkhead door, but either may be fastened on the inside by movable bolts or hooks. All key-locks on scuttles and on bulkhead doors shall be removed. No stairway leading to the roof in a tenement house shall be removed.

#### *Stairs and Public Halls.*

SECT. 45. Every tenement house hereafter erected shall have at least one stairway extending from the entrance floor to the roof, and every tenement house hereafter erected containing more than one hundred rooms above the first floor, exclusive of water-closets and bathrooms, shall have an additional separate stairway for every additional one hundred rooms or fraction thereof. Public halls therein shall each be at least three feet wide in the clear, and stairs shall be at least three feet wide between the wall and the stair rail.

Each stairway shall have an entrance on the entrance floor from a street or alley or open passageway or from an outer court, or from an inner court which connects directly with a street or alley or open passageway. All stairs shall be constructed with a rise of not more than eight inches, and with treads not less than nine inches wide and not less than three feet long in the clear. Where winders are used all treads at a point eighteen inches from the strings on the wall side shall be at least ten inches wide.

In every tenement house all stairways shall be provided with proper balusters and railings kept in good repair. No public hall or stairs in a tenement house shall be reduced in width so as to be less than the minimum width prescribed in this section.

#### *Stair Halls, Construction of.*

SECT. 46. In tenement houses hereafter erected which do not exceed five stories above the cellar or basement or sixty-five feet in height the stair halls shall either be constructed with iron beams and fireproof filling or shall be filled in between the floor beams with at least five inches of cement deafening. In such houses the stairs may be of wood, provided that the soffits are covered with metal laths and plastered with two coats of mortar, or with good quality plaster-boards not less than one half inch in thickness made of plaster and strong fiber, and all joints made true and well pointed, and provided that such stairs are furnished with firestops.

#### *Stair Halls, how Enclosed.*

SECT. 47. In second class and third class tenement houses hereafter erected, the stair halls may be enclosed with wooden stud partitions, if such partitions are covered on both sides with metal laths or with good quality plaster-boards not less than one half inch in thickness, made of plaster and strong fibre, and all joints made true and well pointed, and provided that the space between the studs is filled in with brick and mortar or other incombustible material to the height of the floor beams.

#### *Entrance Halls.*

SECT. 48. Every entrance hall in every tenement house hereafter erected shall be at least three feet six inches wide in the clear, from the entrance up to and including the stair enclosure, and beyond this point at least three feet wide in the clear, and shall comply with all the conditions of the preceding sections of this act as to the construction of stair

halls, except that in a fireproof tenement house hereafter erected the entrance hall may be enclosed with terra-cotta blocks not less than four inches thick and angle-iron construction, instead of brick walls. If such entrance hall is the only entrance to more than one stairway, that portion of said hall between the entrance and the stairway shall be increased at least eighteen inches in width in every part for each additional stairway.

*Cellar Ceilings.*

SECT. 49. In all tenement houses of the second or third class hereafter erected, the cellar and basement ceilings shall be lathed with metal laths and plastered.

*Partitions, Construction of.*

SECT. 50. In all tenement houses of the second or third class hereafter erected all stud partitions which rest directly over each other shall run through the wooden floor beams and rest upon the cap of the partition below, and shall have the studding filled in solid between the uprights to the depth of the floor beams with suitable materials.

*Wooden Tenement Houses.*

SECT. 51. Outside of the building limits, tenement houses not exceeding three stories in height above the basement, nor eighteen hundred square feet in area, may be erected of wood. No wooden tenement house shall be increased in height so as to exceed three stories above the basement or cellar.

*Shafts.*

SECT. 52. All elevator or dumb-waiter shafts hereafter constructed in any tenement house shall be fireproof throughout, with fireproof self-closing doors at all openings at each story. But nothing in this section shall be so construed as to require enclosures about elevators or dumb-waiters in the well-hole of stairs where the stairs themselves are enclosed in walls of incombustible materials, and are entirely constructed of fireproof materials as hereinbefore provided. Every vent shaft hereafter constructed in any tenement house shall have an intake of at least the dimensions provided for vent courts in section sixty-one, and shall be of the same minimum dimensions; and the skylight covering such vent shaft shall be raised at all points at least one foot above the top of the walls of such vent shaft, and the space between the top of said walls and the skylight shall remain at all points open and unobstructed except for such supports essential to the stability of the skylight, as may be approved by the commissioner.

*Bakeries and Fat Boiling.*

SECT. 53. No bakery and no place of business in which fat is boiled shall be maintained in any tenement house which is not fireproof throughout, unless the ceiling and side walls of said bakery or of the said place where fat boiling is done are made safe by fireproof materials around the same, and there shall be no openings either by door or window, dumb-waiter shafts or otherwise, between said bakery or said place where fat is boiled in any tenement house and the other parts of the building.

*Other Dangerous Businesses.*

SECT. 54. All transoms and windows opening into halls from any part of a tenement house where paint, oil, spirituous liquors or drugs are stored for the purpose of sale or otherwise shall be glazed with wire-glass, or they shall be removed and closed up as solidly as the rest of the wall. There shall be between any such hall and such part of said tenement house a fireproof self-closing door.

LIGHT AND VENTILATION.

*Yards.*

SECT. 55. The requirements for yards hereinafter provided shall be deemed sufficient for all tenement houses.

Except in those cases hereinafter provided for, there shall be, behind every tenement house hereafter erected, a yard extending across the entire width of the lot, and at every point open from the ground to the sky unobstructed, except by fire-escapes or unenclosed outside stairs.

The depth of said yard shall be measured from the extreme rear wall of the house to the rear line of the lot, and at right angles to said line, except that where there is an alley or open passageway in the rear of the lot the depth of the yard may be measured to the middle of said alley or open passageway. On an irregular lot of several depths, where there is more than one rear line to the lot, such yard may extend across the entire width of the lot in sections, provided that each section of the yard is in every part and at every point of the minimum depth hereinafter prescribed. Where the side lines of a lot converge toward the rear, the depth of the yard shall be such as to give it an area equal to the greatest width of the yard multiplied by the depth hereinafter prescribed.

Except on a corner lot, the depth of the yard behind every tenement house hereafter erected fifty feet in height or less shall be not less than twelve feet in every part. All yards without exception shall be increased in depth at least one foot for every additional ten feet of height of the building, or fraction thereof, above fifty feet.

Except as hereinafter otherwise provided, the depth of the yard behind every tenement house hereafter erected upon a corner lot shall not be less than six feet in every part. But where such corner lot is more than twenty-five feet in width, the depth of the yard for that portion in excess of twenty-five feet shall be not less than twelve feet in every part, and shall increase in depth as above provided.

Whenever a tenement house is hereafter erected upon a lot which runs through from street to street, or from a street to an alley or open passageway, and said lot is one hundred and fifty feet or more in depth, said yard space shall be left midway between the two streets, and shall extend across the entire width of the lot, and shall be not less than twenty-four feet in depth from wall to wall, and shall be increased in depth at least two feet for every additional ten feet in height of the building, or fraction thereof, above fifty feet.

When a tenement house hereafter erected does not front upon a street, a public alley, or a passageway, not less than fifteen feet wide, the requirements in this section as to yards shall apply to the front of such tenement house as well

as to the rear. Neither the yard behind one tenement house nor any part thereof shall be deemed to satisfy in whole or in part the requirement of a yard in front of another tenement house.

*Cases in which no Yard shall be required.*

SECT. 56. No yard shall be required behind a tenement house hereafter erected upon a lot which abuts at the rear upon a railroad right of way, a cemetery or a public park.

No yard shall be required behind a tenement house hereafter erected upon a lot entirely surrounded by streets or by streets, alleys or open passageways, not less than fifteen feet in width, or by such streets, alleys, and passageways and a railroad right of way, a cemetery or a public park.

No yard shall be required behind a tenement house hereafter erected upon a lot less than one hundred and fifty feet deep and running through from street to street or from a street to an alley or open passageway not less than fifteen feet in width, or upon a corner lot adjoining a lot less than one hundred and fifty feet deep and running through from street to street, or from a street to such an alley or open passageway.

No yard shall be required behind a tenement house hereafter erected upon a corner lot adjoining a lot more than one hundred and fifty feet deep and running through from street to street or from a street to an alley or open passageway not less than fifteen feet in width; but if there be no yard, an outer court upon such corner lot shall extend from the street along the line of such adjoining lot to a point in line with the middle line of the block; the width of said court to be not less than the width of court prescribed in the ensuing paragraph.

No yard shall be required behind a tenement house hereafter erected upon a corner lot adjoining two or more lots any one of which bounds upon a single street, or alley, or open passageway not less than fifteen feet in width; but if there be no yard an outer court upon such corner lot shall extend from the street, or from such alley or open passageway along a lot line either to the extreme rear of an adjoining lot or to the extreme rear of said corner lot: *provided*, that the width of said court measured from the lot line to the opposite wall of the building, for tenement houses fifty feet or less in height, shall be not less than six feet in every part, and for every additional ten feet of height of the tenement house shall be increased one foot throughout the whole length of said court.

*Courts.*

SECT. 57. No court of a tenement house hereafter erected shall be covered by a roof or skylight, but every such court shall be at every point open to the sky unobstructed. Except such courts as are provided for in section fifty-six, all courts, except for fire-escapes, may start at the second tier of beams.

*Outer Courts.*

SECT. 58. The provisions of this section shall apply only to tenement houses hereafter erected. Where one side of an outer court is located on the lot line, the width of the said court, measured from the lot line to the opposite wall of the building, for tenement houses fifty feet or less in height shall not be less than six feet in every part; and for every ten feet of increase or fraction thereof in height of such tenement houses, such width shall be increased one foot throughout the whole length of the court, and except where the court runs through from the yard to the street, said width shall never be less than one eighth of the length of the court.

Where an outer court is located between wings or parts of the same building, or between different buildings on the same lot, the width of the court, measured from wall to wall, for tenement houses fifty feet or less in height shall not be less than twelve feet in every part, and for every ten feet of increase or fraction thereof in the height of the said building, such width shall be increased two feet throughout the whole length of the court. The depth of such courts shall never exceed four times their width.

Wherever an outer court changes its initial horizontal direction, or wherever any part of such court extends in a direction so as not to receive direct light from the street or yard, or from an alley, or open passageway not less than fifteen feet in width, the length of that part of the court shall never exceed its width, such length to be measured from the point at which the change of direction begins. Wherever an outer court between parts of the same building is twelve feet or less in depth, its width may be one half its depth, provided that such width is never less than four feet in the clear. This exception shall also apply to every offset or recess in outer courts. And no window except windows of water-closet compartments, bathrooms, or halls shall open upon any offset or recess less than four feet in width.

*Inner Courts.*

SECT. 59. The provisions of this section shall apply only to tenement houses hereafter erected. Where one side of an inner court is located on the lot line and the building does not exceed fifty feet in height, the least width of the court shall be not less than eight feet, and the area of the court shall be not less than one hundred and twenty-eight square feet. For every ten feet or fraction thereof of increase in the height of the building above fifty feet the minimum width of such inner courts shall be increased by one foot, and the area thereof shall never be less than twice the square of such minimum width. Where an inner court is not located on the lot line, but is enclosed on all four sides, and the building does not exceed fifty feet in height, the least width of said court shall be not less than sixteen feet and the area not less than two hundred and fifty-six square feet. For every ten feet, or fraction thereof, of increase in the height of said building above fifty feet, the minimum width of such inner courts shall be increased by two feet, and the area of the court shall never be less than the square of such minimum dimension.

*Vent Courts.*

SECT. 60. Inner courts used solely for the lighting and ventilation of water-closets, bathrooms, public halls, or stair halls, or for interior fire-escapes, may be constructed in any tenement house, and shall be not less than fifteen square feet in area, nor less than three feet in the least horizontal dimension for buildings fifty feet or less in height. For every increase of ten feet or fraction thereof in the height of such buildings the least dimension shall be increased by one foot, and the area by not less than eight square feet.



*Intakes.*

SECT. 61. Every inner court in a tenement house hereafter erected shall be provided with one or more horizontal intakes at the bottom. Such intakes, in vent courts, shall be not less than four square feet in area, so arranged as to be easily cleaned; in other inner courts they shall be not less than three feet wide and seven feet high, and there shall be at least two open grille doors, containing not less than fifteen square feet of unobstructed openings, one at the inner court and the other at the street or yard as the case may be.

Nothing contained in the foregoing sections concerning outer and inner courts shall be construed as prohibiting windows in walls that cut off the angles of such courts, provided that the running length of the walls containing such windows does not exceed six feet.

*Buildings on the Same Lot with Tenement Houses.*

SECT. 62. No tenement house shall hereafter be so enlarged or its lot so diminished, and no building of any kind shall be hereafter so placed upon the same lot with a tenement house, as to decrease the minimum depth of yards or the minimum size of courts or yards prescribed in this act for tenement houses hereafter erected.

*Rooms, Lighting and Ventilation of.*

SECT. 63. In every tenement house hereafter erected there shall be in each room, except water-closet compartments and bathrooms, windows of a total area of at least one eighth of the floor area of the room, opening directly on a street or public alley or open passageway not less than fifteen feet wide or upon a yard or court of the dimensions hereinbefore specified, or upon a railroad right of way, cemetery or public park; and such windows shall be located so as properly to light all parts of the room. The top of at least one window shall be not less than eight feet above the floor, and the upper half of it shall be made so as to open the full width.

Every alcove in every tenement house hereafter erected shall be provided with an opening into a room, such opening to be equal in area to eighty per cent of that side of the alcove in which the opening is located; and the alcove shall have at least one window of not less than fifteen square feet of glazed surface opening as provided in this section.

*Rooms, Size of.*

SECT. 64. In every tenement house hereafter erected all rooms, except water-closet compartments and bathrooms, shall be of the following minimum sizes: In each apartment there shall be at least one room containing not less than one hundred and twenty square feet of floor area and provided with a chimney flue and thimble, except where said room is furnished with heat from a central heating apparatus, and every other room shall contain at least ninety square feet of floor area. Each room shall be in every part not less than eight and one half feet high from the finished floor to the finished ceiling; provided that only one half of an attic room need be eight and one half feet high.

No portion of a room in any such tenement house shall be partitioned off so as to form a room not conforming to the provisions of sections sixty-three and sixty-four, or so as to form an alcove not conforming to sections sixty-three and seventy.

*Public Halls.*

SECT. 65. Except as otherwise provided in section sixty-six, in every tenement house hereafter erected, every public hall shall have at least one window opening directly upon a street, a public alley or open passageway not less than ten feet in width, a railroad right of way, a cemetery or a public park, or upon a yard or court or a vent court as provided in section sixty. Either such window shall be at the end of said hall, with the plane of the window substantially at right angles to the axis of the hall, or there shall be at least one window opening as above prescribed in every twenty feet in length or fraction thereof of the hall; but this provision for one window in every twenty feet of hall-way shall not apply to that part of the entrance hall between the entrance and the first flight of stairs, provided that the entrance door contains not less than five square feet of glazed surface. At least one of the windows provided to light each public hall shall be at least two feet six inches wide and five feet high, measured between the top beads.

Any part of a hall which is shut off from any other part of said hall by a door or doors shall be deemed a separate hall within the meaning of this section.

*Windows for Stair Halls, Size of.*

SECT. 66. In every tenement house hereafter erected the aggregate area of windows to light or ventilate stair halls on each floor shall be at least fifteen square feet: *provided, however,* that when there shall be, within the space enclosed by the stairway and its landings, from the second story upward, an open area for light and ventilation whose least horizontal dimension shall be equal to the width of the stairs, but in no case less than three feet, then the windows required in sections sixty-five and sixty-six may be omitted.

There shall be in the roof, directly over each stair well, in all tenement houses hereafter erected, without windows as above provided, a ventilating skylight provided with ridge ventilators, having a minimum opening of forty square inches, or else such skylight shall be provided with fixed or movable louvres. The glazed roof of the skylight shall not be less than twenty square feet in area.

*Privacy.*

SECT. 67. In every apartment of four or more rooms in a tenement house hereafter erected, at least one water-closet compartment shall be accessible without passing through any bedroom.

*Basements in Tenement Houses hereafter erected.*

SECT. 68. In tenement houses hereafter erected no room in the basement shall be occupied for living purposes, unless all of the following conditions are complied with: —

- (1.) Such room shall be at least eight and one half feet high in every part from the floor to the ceiling.

(2.) There shall be appurtenant to such room the use of a separate water-closet, constructed and arranged as required by section sixty-nine.

(3.) Such room shall have a window or windows opening upon the street, an alley or open passageway not less than fifteen feet in width, a railroad right of way, cemetery or public park or upon a yard or court. The total area of windows in such room shall be at least one eighth of the floor area of the room, and one half of the sash shall be made to open full width, and the top of each window shall be within six inches of the ceiling.

(4.) The floor of such room shall be damp-proof and waterproof, and all walls surrounding such room shall be damp-proof.

*Water-closets in Tenement Houses hereafter erected.*

SECT. 69. In every tenement house hereafter erected there shall be a separate water-closet in a separate compartment within each apartment of four or more rooms. Where apartments consist of less than four rooms there shall be at least one water-closet for every three rooms, and on the same floor with said rooms. Every such water-closet shall be placed in a compartment completely separated from every other water-closet, and such compartment shall be not less than two feet and four inches wide, and shall be enclosed with plastered partitions, or some equally substantial material, which shall extend to the ceiling. Such compartment shall have a window, opening directly, or through a straight horizontal shaft of the same dimensions as the window and not more than four feet long, upon a street, a railroad right of way, cemetery or public park or a yard or alley or open passageway not less than four feet wide, or upon a court vent or upon a covered passageway not more than twenty feet long and at least twenty feet wide, and twenty feet high. Every such window shall be at least one foot by three feet between stop heads; and the whole window shall be made so as to open readily. When, however, such water-closet compartment is located on the top floor and is lighted and ventilated by a skylight over it, no window shall be necessary, provided that the roof of such skylight contains at least three square feet of glazed surface and is arranged so as to open readily. Nothing in this section in regard to the separation of water-closet compartments from each other shall apply to a general toilet room containing several water-closets, hereafter placed in a tenement house, provided that such water-closets are supplemental to the water-closet accommodations required by law for the use of the tenants of the said house. Nothing in this section in regard to the ventilation of water-closet compartments shall apply to a water-closet hereafter placed in an existing tenement house, to replace a defective fixture in the same position and location. No water-closet shall be maintained in the cellar of any tenement house without a permit in writing from the board of health; and said board shall have power to make rules and regulations governing the maintenance of such closets. Every water-closet compartment in any tenement house shall be provided with proper means of lighting the same at night. If fixtures for gas or electricity are not provided in such compartment, then the door of such compartment shall be provided with translucent glass panels, or with a translucent glass transom, not less in area than four square feet. The floor of every such water-closet compartment shall be made waterproof with asphalt, tile, stone or some other waterproof material; and such water-proofing shall extend at least six inches above the floor on all sides of the compartment except at the door opening, so that the floor can be washed or flushed without leaking. No drip trays shall be permitted. No water-closet fixtures shall be inclosed with any woodwork.

*Lighting and Ventilation of Existing Tenement Houses.*

SECT. 70. Excepting water-closet compartments and bathrooms, wherever a room in any tenement house has a window or windows of less than nine square feet of glazed surface opening on a street, a railroad right of way, cemetery, public park, alley or open passageway not less than ten feet in width, such window or windows shall be enlarged and provided with the above mentioned glazed surface, and wherever such room does not open as above provided, or opens upon an alley or open passageway less than ten feet in width or upon a shaft or upon a court less than six feet in its least dimension, then such room shall be provided with a sash window communicating with another room in the same apartment, having windows of at least the superficial area prescribed for the windows of rooms in tenement houses hereafter erected and opening on a street, a railroad right of way, cemetery, public park or alley or open passageway at least ten feet in width, or on a court or courts at least equivalent to the courts required in sections fifty-eight and fifty-nine; and such new sash window shall contain not less than fifteen square feet of glazed surface and shall be made so as to open readily. One wall of every alcove in an existing tenement house shall be provided with an opening equal in area to eighty per cent of the wall. No tenement house shall be so altered as to reduce the provisions for the light and ventilation of any room or alcove or public hall or stair hall below the requirements of this act.

*Skylights.*

SECT. 71. In every existing tenement house there shall be in the roof, directly over each stair well, a ventilating skylight, provided with ridge ventilators and also with fixed or movable louvres or movable sashes. But this section shall not apply to any tenement house now having windows as provided in section sixty-five or a bulkhead in the roof over the main stairs, which bulkhead is provided with windows made so as to open readily, and with not less than twelve square feet of glass in the top of the bulkhead. All skylights hereafter placed in any tenement house shall conform to the provisions of section sixty-six. All the existing dome lights or other obstructions to skylight ventilation shall be removed.

Where the public hall in an existing tenement house is not provided with windows opening as provided in section sixty-five, and where there is not a stair well as provided in section sixty-six, all doors leading from such public hall into apartments shall be provided with translucent glass panels of an area of not less than four square feet for each door; or such public hall may be lighted by a window or windows at the end thereof with the plane of the window at right angles to the axis of the hall, said window opening upon the street, a railroad right of way, cemetery, public park, or an alley or open passageway at least ten feet in width, or upon a yard or court of the dimensions hereinbefore provided.

*Water-closets in Existing Tenement Houses.*

SECT. 72. In existing tenement houses the woodwork enclosing the space underneath the seat of all water-closets used in common by two or more families shall be removed and such space shall be left open. The floor or other surface beneath and around such closet shall be maintained in good order and repair, and the floors made waterproof to the satisfaction of the board of health.

Every such water-closet shall be located in a compartment completely separated from every other water-closet, and such compartment shall be ventilated to the satisfaction of the board of health. There shall be provided at least one water-closet for every three families or for every nine rooms in every existing tenement house.

*Water Supply.*

SECT. 73. In every tenement house hereafter erected there shall be in each apartment a proper sink with running water.

Every existing tenement house shall have water furnished in sufficient quantity at one or more places on each floor occupied by or suitable to be occupied by one or more families. The owner shall provide proper and suitable tanks, pumps or other appliances to receive and to distribute a sufficient supply of water at each floor in the said house at all times of the year, during all hours of the day and night.

The woodwork enclosing sinks located in the public halls or stairs shall be removed, and the space underneath the sinks shall be left open. The floors and wall surfaces beneath and around the sink shall be maintained in good order and repair.

*Drainage of Courts and Yards.*

SECT. 74. In every tenement house all courts, areas, intakes and yards shall be properly graded, drained and paved or otherwise surfaced to the satisfaction of the board of health.

*Receptacles for Garbage and Ashes.*

SECT. 75. The owner of every tenement house shall provide therefor suitable, covered, water-tight receptacles satisfactory to the board of health, for ashes, rubbish, garbage, refuse and other matter. No person shall place ashes, rubbish, garbage, refuse or other matter in the yards, open areas or alleys connected with, or appurtenant to, any tenement house except in suitable receptacles provided for the same.

*Powers of the Building Commissioner.*

SECT. 76. The commissioner shall not dispense with any of the requirements of sections forty-two to seventy-five, inclusive.

## THEATRES.

*Definition.*

SECT. 77. Every building hereafter erected so as to contain an audience hall and a stage, with curtain, movable or shifting scenery, and machinery, adapted for the giving of plays, operas, spectacles or similar forms of entertainment, and of a size to provide seats for more than five hundred spectators shall be a theatre within the meaning of this act. No existing building not now used as a theatre shall be altered and used as a theatre, unless it conforms to the provisions of this act for a new theatre.

*Construction.*

SECT. 78. Every theatre hereafter built shall be of fireproof construction throughout, except that the floor boards may be of wood, and the steel work of the stage, of the fly galleries, and of the rigging loft need not be fireproofed.

*Open Courts.*

SECT. 79. Every theatre built in a block not on a corner shall have an open court or passageway on both sides extending from the proscenium line to the line of the street on the front, or, in case the building abuts on a street both in front and rear, these passages may extend from the line of the front of the auditorium to the line of the rear street. These passages shall be at least six feet wide throughout their length, and shall not be closed by any locked gate or doorway. They shall immediately adjoin the auditorium, or a side passage or lobby directly connected therewith. These passages shall be open to the sky opposite the whole depth of the auditorium, but may be carried out to the street front or rear through passages enclosed by brick walls or other fireproof material equally efficient, and covered by a solid brick vault at least eight inches thick, each passage to be not less than eight feet wide and ten feet high throughout.

SECT. 80. Every theatre built upon the corner of two streets shall have one inner court on the side of the building away from the side street, such court to be of the same description as the courts provided for in the preceding paragraph.

*Stores, etc.*

SECT. 81. Nothing in this act shall be construed to prohibit the use of any part of a theatre building for stores, offices, or for habitation, provided that the parts so used shall be built with exits to the street entirely distinct from the rest of the building and shall be separated from the rest of the building by solid partitions or walls, without any openings in the same.

*Floor Levels.*

SECT. 82. In all theatres, the entrances shall be not more than one step above the level of the sidewalk of the main street, and the stage shall be not more than five feet above the said level.

*Proscenium Wall.*

SECT. 83. The stage of every theatre shall be separated from the auditorium by a wall of fireproof construction, which wall shall extend the whole width of the auditorium and the whole height to the roof of the portion occupied by

the stage. There shall be no openings through this wall except the curtain opening, one doorway each side behind the boxes, and one doorway which shall be located at or below the level of the stage. The doorways shall not exceed twenty-one superficial feet each, and shall have standard fire-doors hung in a manner satisfactory to the commissioner. The finish or decorative features around the curtain opening of every theatre shall be of fireproof material.

*Curtain.*

SECT. 84. The proscenium or curtain opening of every theatre shall have a fire-resisting curtain reinforced by wire netting or otherwise strengthened. If of iron, or similar heavy material, and made to lower from the top, it shall be so arranged as to be stopped securely at a height of seven feet above the stage floor, the remaining opening being closed by a curtain or valance of fire-resisting fabric.

*Stage Floor.*

SECT. 85. The part of the stage floor, usually equal to the width of the proscenium opening, used in working scenery, traps or other mechanical apparatus, may be of wood, and no flooring used thereon shall be less than one and one eighth inches in thickness.

*Ventilators.*

SECT. 86. There shall be one or more ventilators near the centre, and above the highest part of the stage of every theatre, of a combined area of opening satisfactory to the commissioner, and not less than one tenth of the area of the undivided floor space behind the curtain at the stage floor level. The openings in every such ventilator shall be closed by valves or louvres so counterbalanced as to open automatically, which shall be kept closed, when not in use, by a fusible link and cord reaching to the prompter's desk, and readily operated therefrom. Such cord shall be of combustible material, and so arranged that if it is severed the ventilator will open automatically.

Skylight coverings for ventilators shall have sheet metal frames set with double-thick glass, each pane thereof measuring not less than three hundred square inches, or shall be protected with wire glass. If wire glass is not used, a suitable wire netting shall be placed immediately beneath the glass, but above the ventilator opening. Illuminating fixtures over the auditorium shall be suspended and secured in a manner approved by the commissioner.

Glass on illuminating fixtures over the auditorium shall be secured from danger of falling as the commissioner shall require, but in no case shall any glass more than six inches in diameter or length be hung over the auditorium unless protected from falling by a wire netting or similar device satisfactory to the commissioner.

*Seats in Auditorium.*

SECT. 87. All seats in the auditorium excepting those contained in boxes shall be spaced not less than thirty inches from back to back, measured in a horizontal direction, and shall be firmly secured to the floor. No seat in the auditorium shall have more than six seats intervening between it and an aisle, on either side.

The platforms for seats in balconies and galleries shall nowhere have a greater rise than twenty-one inches, nor be less than thirty inches from back to back.

*Aisles.*

SECT. 88. All aisles on the respective floors in the auditorium, having seats on both sides of the same, shall be not less than thirty inches wide where they begin, and shall be increased in width toward the exits in the ratio of one inch to five running feet. Aisles having seats on one side only shall be not less than two feet wide at their beginning and shall increase in width, the same as aisles having seats on both sides.

*Changes in Level.*

SECT. 89. All changes in the levels of the floors of such buildings, except under stairways, from story to story, and except the necessary steps in galleries and balconies rising toward the exits, shall be made by inclines of no steeper gradient than two in ten within the auditorium, and rising toward the exits, and one in ten for all others.

*Lobbies.*

SECT. 90. Preceding each division of the theatre there shall be foyers, lobbies, corridors, or passages, the aggregate capacity of which on each floor or gallery shall be sufficient to contain the whole number to be accommodated on such floor or gallery in the ratio of one square foot of floor room for each person.

*Stage Doors.*

SECT. 91. There shall be not less than two exit doors, each not less than three feet in width, located on opposite sides of the stage, and opening directly upon a street, alley, court, or courtway leading to a public thoroughfare.

*Room Exits.*

SECT. 92. All rooms in theatres for the use of persons employed therein shall have passages to at least two independent means of exit.

*Doors to Open Outward.*

SECT. 93. All doors of exit or entrance shall open outward, and shall be hung so as to swing in such a manner as not to become an obstruction in a passage or corridor, and no such doors shall be fastened so as to be inoperative when the building is occupied by an audience.

*False Doors.*

SECT. 94. No mirrors shall be so placed as to give the appearance of a doorway or exit, hallway, or corridor, nor shall there be any false doors or windows.

*Main Floor and First Gallery Exits.*

SECT. 95. A common exit may serve for the main floor of the auditorium and the first gallery, provided that its capacity be equal to the aggregate capacity of the outlets from the main floor and the said gallery: and provided that the lowermost run of any exit leading from a gallery shall not open directly at right angles with the central axis of a common exit unless there is a clear space or landing of at least one and one quarter times the width of the exit between the foot of such exit and such centre line or nearest exit doorway.

*Exits.*

SECT. 96. Two distinct and separate exits shall be provided for each gallery and balcony above the main floor; and the same shall be located on opposite sides of the galleries.

All gallery or balcony exits shall start with a width of not less than four feet at the uppermost gallery.  
Exits from balconies and galleries shall not communicate with the basement or cellar.

*Aggregate Widths of Exit.*

SECT. 97. The aggregate width of all the exits previously described shall be estimated on a basis of not less than twenty inches for every one hundred persons for whom seats are provided in the sections of the auditorium served by the respective exits.

*Emergency Exits.*

SECT. 98. In addition to the exits previously described there shall be one exit from each side of each gallery, balcony, and main floor of auditorium, at least five feet wide, leading to exterior balconies not less than four feet wide and twenty feet long on each side of the auditorium. From such balconies there shall be staircases extending to the ground level, which may be counterweighted, with risers of not over eight and one half inches and treads of not less than nine and one half inches, exclusive of nosing. The aggregate width of these emergency stairs shall be not less than ten inches for every one hundred people served thereby, no single stairs being less than thirty inches wide. If counterweighted, these stairs shall be lowered during all performances.

Where all such stairs are in an interior court, each run shall be covered by a light awning of iron.

Nothing herein shall prohibit the building of emergency stairs and exits inside the walls of the building, provided that they are surrounded by a fireproof partition not less than four inches thick separating the exits and stairways from the audience room or auditorium.

*Additional Requirements.*

SECT. 99. The commissioner shall have power to require a greater number or capacity of exits than is herein prescribed.

In every theatre there shall be over every exit, on the inside, and over every opening to a fire-escape, on the inside, an illuminated sign, bearing the word "exit" or "fire-escape," respectively, in letters not less than four inches high. The lights for the exit signs, passages, stairs, lobbies, auditoriums, rear of auditoriums, balconies, galleries, and for the balconies and stairs outside the building, shall be so arranged that they can be turned on or off independently of the means provided on the stage or in any part of the building in the rear of the proscenium wall. Every exit sign shall be kept illuminated, and every outside balcony and fire-escape shall be kept well lighted during the performance, except outside exits during a performance before sunset.

Plans showing the exits and stairways shall be legibly printed so as to occupy a full page of every programme or play-bill.

In said buildings there shall be such number of gas pipe outlets as the commissioner may require, fitted with no less than two gas burners. Such burners shall be inspected and tried at least once in every three months by inspectors of the department, to ascertain if they are in proper working order. The inspector shall make a report of each visit, stating the condition of the burners and the action of the inspector in regard to them.

The commissioner shall have authority to order any defect in the working of such burners as are necessary for public safety to be remedied.

So much of this section as applies to the inspection of gas burners shall apply to buildings now used as theatres.

*Stairs.*

SECT. 100. The cut of the stair stringers shall not exceed seven and one half inches rise, nor be less than ten and one half inches tread. There shall be no flights of stairs of more than fifteen or less than three steps between landings.

*Landings of Stairs.*

SECT. 101. Every landing shall be at least four feet wide. When straight stairs return directly on themselves, a landing of full width of both flights, without any steps, shall be provided. The outer line of landings shall be curved to a radius of not less than two feet to avoid square angles. Stairs turning at an angle shall have a proper landing without winders introduced at the turn. No door shall open immediately upon a flight of stairs, but a landing at least two feet wider than the width of the door opening shall be provided between such stairs and such door. When two side flights connect with one main flight, no winders shall be introduced, and the width of the main flight shall be at least equal to the aggregate width of the side flights.

*Hand-rails.*

SECT. 102. All enclosed stairways shall have, on both sides, strong hand-rails, firmly secured to the wall, about three inches distant therefrom and about three feet high above the stairs.

All stairways eight feet and over in width shall be provided with a central rail of metal or hard wood, not less than two inches in diameter, placed at a height of about three feet above the centre of the treads, supported on wrought



metal or brass standards of sufficient strength, securely bolted to the treads or risers of the stairs; and at the head of each flight of stairs, and on each side of the landing, the post or standard shall be at least six feet in height, and the rail shall be secured to the post.

*Measurements for Width of Stairs.*

SECT. 103. The width of all stairs shall be measured in the clear between the hand-rails. No winding or circular stairs shall be permitted.

*Radiators Forbidden in Passageways.*

SECT. 104. No coil or radiator or floor register shall be placed in any aisle or passageway used as an exit; but all such coils and radiators may be placed in recesses formed in the wall or partition to receive the same.

No boiler, furnace, engine or heating apparatus, except steam, hot water or hot air pipes or radiators, shall be located under the auditorium or under any passage or stairway or exit of any theatre.

*Sprinklers and Standpipes.*

There shall be at least two two-inch high-service standpipes on the stage of every theatre, with ample provision of hose nozzles at each level of the stage on each side, and the water shall be kept turned on during the occupation of the building by an audience. The said pipes shall in no case be sealed, and shall have two gates, one above the other, with a proper test or waste valve; the lower gate to be kept open at all times. The proscenium opening of every theatre shall be provided with a two and one half inch perforated iron pipe, or equivalent equipment of automatic or open sprinklers, so constructed as to form, when in operation, a complete water curtain for the whole proscenium opening, and there shall be for the rest of the stage a complete system of fire apparatus and perforated iron pipes, automatic or open sprinklers. Such pipes or sprinklers shall be supplied with water by high pressure service, and shall be at all times ready for use.

PLACES OF PUBLIC ASSEMBLY.

SECT. 105. Every building hereafter erected with a hall or assembly-room to contain a public audience of more than eight hundred persons, or with more than one superimposed gallery or balcony, shall be of fireproof construction throughout; except that halls or assembly-rooms, the mean level of the main floor of which is not more than five feet above the grade of the adjacent street, may have roofs of second class construction.

Every building hereafter erected with a hall or assembly-room to contain an audience of more than six hundred persons, the main floor of which is raised more than fifteen feet above the level of the principal street upon which it faces, shall be of fireproof construction throughout.

The capacity of a hall or assembly-room shall be estimated on the basis of six square feet for each person.

If several halls or assembly-rooms are provided in one building, their aggregate capacity shall be considered as determining whether or not the building shall be of fireproof construction, unless the several halls are enclosed by or separated from each other by fireproof walls, with fireproof doors in the same, in which case the building may be of second class construction.

No existing building shall be altered to contain a hall or assembly room exceeding the foregoing dimensions, unless the whole building as altered shall conform to the provisions of this act.

*Moving Picture Shows.*

SECT. 106. All moving picture shows shall be subject to the provisions of chapter one hundred and seventy-six and of chapter four hundred and thirty-seven of the acts of the year nineteen hundred and five, and of any amendments thereof or additions thereto now or hereafter made.

*Exits, Etc.*

SECT. 107. Every building hereafter erected containing a hall or assembly room shall conform to all the aforesaid requirements as to exits, stairways, exit lights, aisles, and seats which apply to theatres, subject to such exceptions as the board of appeal shall approve.

*Roof Gardens.*

SECT. 108. Nothing herein contained shall prevent the placing of a roof garden, art gallery, or rooms for similar purposes above a theatre, provided the floor of the same forming the roof over such theatre shall be constructed of fireproof materials, and shall have no covering boards or sleepers of wood. Every roof over such garden or other rooms shall have all supports and rafters of steel, and, if covered, shall be covered with glass or fireproof material, or both.

*Exits from Roof Gardens.*

SECT. 109. Exits from roof gardens may communicate with stairs leading from the auditorium of the theatre, but they shall be at least four in number, not less than four feet six inches wide, and distinct and separate from each other from roof to street.

*Summer Theatres.*

SECT. 110. Summer theatres, if built without the building limits, and located thirty feet distant from any other building or structure or adjoining lot lines, and of no greater seating capacity than seven hundred and fifty persons, and not more than one story high, without balconies, or galleries, may be constructed as follows:—

The auditorium, without a cellar or basement, with open sides of double the number of exits as hereinbefore provided, opening directly into the surrounding courts or gardens at the grade level, and the adjoining dressing-rooms, may be of wooden construction, but the stage shall be enclosed in brick walls not less than twelve inches thick, or shall be

plastered on metal lathing throughout: *provided*, that the openings leading to the dressing-rooms shall be provided with fire-doors.

Otherwise, all protective features and arrangements shall comply with all previous sections of this title.

*Existing Theatres.\**

SECT. 111. All stairs and landings of theatres shall have throughout proper hand-rails on both sides firmly secured to walls or to strong posts and balusters. Stairways twelve feet or more wide shall have one or more intermediate rails not more than eight feet apart and properly supported.

No boiler, furnace, engine or heating apparatus, except steam, hot water or hot air pipes or radiators, shall be located under the auditorium nor under any passage or stairway or exit of any theatre.

In every theatre there shall be over every exit, on the inside, and over every opening to a fire-escape, on the inside, an illuminated sign, bearing the word "exit" or "fire-escape," respectively, in letters not less than four inches high. The lights for the exit signs, passages, stairs, lobbies, auditoriums, rear of auditoriums, balconies, galleries, and for the balconies and stairs outside the building, shall be so arranged that they can be turned on or off independently of the means provided on the stage or from any part of the building in the rear of the proscenium wall. Every exit sign shall be kept illuminated and every outside balcony and fire-escape shall be kept well lighted during the performance, except outside exits during a performance in the daytime and before sunset.

The exits and openings to fire-escapes of all theatres shall open outward and have fastenings on the inside only. They shall be unfastened during every performance and shall be so arranged that they can easily be opened from within. Plans showing the exits and stairways shall be legibly printed so as to occupy a full page of every programme or playbill.

No temporary seats or other obstructions shall be allowed in any aisle, or stairway of a theatre, and no person shall remain in any aisle, passageway or stairway of any such building during any performance.

The proscenium or curtain opening of every theatre shall have a fire-resisting curtain of incombustible material, reinforced by wire netting, or otherwise strengthened. If of iron, or similar heavy material, and made to lower from the top, it shall be so arranged as to be stopped securely at a height of seven feet above the stage floor, the remaining opening being closed by a curtain or valance of fire-resisting fabric. The curtain shall be raised at the beginning and lowered at the end of every performance, and shall be of proper material, construction and mechanism.

There shall be one or more ventilators near the centre, and above the highest part of the stage of every theatre, of a combined area of opening satisfactory to the building commissioner, and not less than one tenth of the area of the proscenium opening. Every such ventilator shall have a valve or louvre so counterbalanced as to open automatically, and shall be kept closed, when not in use, by a fusible link and cord reaching to the prompter's desk, and readily operated therefrom. Such cord shall be of combustible material, and so arranged that if it is severed the ventilator will open automatically.

There shall be at least two two-inch high-service standpipes on the stage of every theatre, with ample provision of hose nozzles at each level of the stage on each side, and the water shall be kept turned on during the occupation of the building by an audience. The said pipes shall have two gates, one above the other, with a proper test or waste valve; the lower gate to be kept open at all times. The proscenium opening of every theatre shall be provided with a two and one half inch perforated iron pipe or equivalent equipment of automatic or open sprinklers, as the commissioner may direct, so constructed as to form when in operation a complete water curtain for the whole proscenium opening, and there shall be for the rest of the stage a complete system of fire apparatus and perforated iron pipes, automatic or open sprinklers. Such pipes or sprinklers shall be supplied with water by high pressure service, and shall be ready for use at all times.

PLUMBING.

*Definition of Terms.*

SECT. 112. The following terms shall have the meanings respectively assigned to them:—

"Repair of leaks" shall mean such repairs as are necessary to protect property, but do not involve any extensive change in construction.

"Y-branches" shall mean a branch at sufficient angle to direct the flow and prevent backing up.

"Air pipes" or "back air pipes" shall mean air pipes from traps that extend toward the main soil pipe or the outer air and connect with not more than three traps.

"Vent pipes" shall mean general lines of back air pipes connecting with more than three fixtures.

"Drain" shall mean that part of the drainage system of a building extending through basement or cellar to sewer.

"Soil pipe" shall mean that part of the drainage system of a building, of four inches or more internal diameter, between basement or cellar and the highest fixture in the building.

"Ventilation pipe" shall mean the extension of the soil pipe from the highest fixture to and through the roof.

"Surface drain" shall mean a connection with drain in the basement to allow egress of surface water or overflow.

"Fixture" shall mean any receptacle or outlet placed for the purpose of disposing of waste water or other matter, and connecting with the waste, soil or drain pipe of a building.

*Registration.*

SECT. 113. No plumber shall engage in or work at the business of plumbing unless he shall first have registered his name and place of business in the office of the commissioner, and no person shall by display of sign or plumbing material, or otherwise, advertise as a plumber unless he shall have been registered or licensed as such. Every master plumber shall conspicuously display his certificate or license within his place of business. Notice of any change in the place of business of a registered or licensed master plumber shall immediately be given by him to the commissioner.

*Notices.*

SECT. 114. Every plumber, before doing any work in a building, shall, except in the case of repair of leaks, file in the office of the commissioner, upon blanks for that purpose, an application for a permit, and if required by the commis-

\* Amended, 1908 or 1909, or both. See page 32.

sioner a plan or sketch of the work to be performed; and no such work shall be done in any building without a written permit from the commissioner.

*Connection with Sewer or Drain.*

SECT. 115. The plumbing of every building shall be separately and independently connected outside the building with the public sewer, if such sewer is provided, or with a proper and sufficient private drain or sewer laid outside of the building, and if a sewer is not accessible, with a proper cesspool. Several buildings may have a common sewer connection if such connection is approved by the commissioner and the superintendent of sewers.

*Inspection and Tests.*

SECT. 116. Pipes or other fixtures shall not be covered or concealed from view until approved by the commissioner, who shall examine or test the same within two working days after notice that they are ready for inspection. Plumbing shall not be used unless, when roughed in, the wastes, vents and back air pipes and traps are first tested by water or sufficient air pressure in the presence of an inspector, when such testing is practicable.

*Soil and Waste Pipes and Traps.*

SECT. 117. The waste pipe of every independent sink, basin, bath-tub, water-closet, slop-hopper, urinal or other fixture shall be furnished with a separate trap, which shall be placed as near as practicable to the fixture which it serves. A sink and set of three wash-trays may be connected to the house drain through one five inch round trap, when the outlet of the sink is not over three feet six inches from the nearest outlet from the wash-trays; and in such case the trap shall be above the floor. The outlet from each fixture shall enter the trap separately. Not more than four wash-bowls or sinks in a continuous line may be connected to the house drain through one five inch round trap. Two or more fixtures on the same level with not more than two feet of waste pipe and connecting into the soil or waste pipe not more than eighteen inches below the top water line of the trap, shall not require other vent than the continuation of the soil or waste pipe full size for its whole length. Lateral branches of soil or waste pipe, if more than twenty feet in length, shall be extended through the roof undiminished in size. All connections on lead waste and back air pipes and of lead pipes to brass ferrules and soldering nipples shall be full size wiped soldered branch, round or flange joints. Soil and waste pipes shall have proper T-Y or Y branches for all fixture connections. No connection to lead bends for water-closets or slop sinks shall be permitted, except the required back air pipe where a continuous vent is not practicable.

Earthenware traps shall have heavy brass floor plates soldered to the lead bends and bolted to the trap flange, and the joint made gas tight with red or white lead. Rubber washers for floor connections shall not be used.

*Back Air Pipes, Vents, Etc.*

Traps shall be protected from siphonage or air pressure by special iron or brass air pipes of a size not less than the waste pipes they serve; back air pipes shall not be connected to the trap or branched into the waste pipe, except where a continuous vent is not practicable, but a suitable non-siphon trap may be used without a back air pipe upon the approval of the commissioner. Back air pipes shall enter the waste pipe within eighteen inches from the trap and shall be a continuation of the waste pipe. Lead air pipes may be used only for short connections where they are exposed to view. Air pipes for water-closet traps shall be connected to the highest point of bend or trap, and may be of two inch bore if for not more than three fixtures and less than thirty feet in length; if for more than three fixtures or more than thirty feet in length they shall be of three inch bore. Air pipes shall be run as direct as practicable and if one and one half inches or less in diameter shall not exceed thirty feet in length. Two or more air pipes may be connected together or with a vent pipe; but in every such case the connection shall be above the top of the fixture. The trap for the upper fixture on a line of soil or waste pipe, if within five feet of the stack in a horizontal line, shall not require a special air pipe, unless the outlet is branched into a stack more than eighteen inches below the top water line of the trap. Diameters of vent pipes shall be not less than two inches for main vents through less than seven stories; three inches for water-closets on more than three floors, and for other fixtures in more than seven stories. All vent pipes shall be increased one inch in diameter before passing through the roof. Vent lines shall be connected at the bottom with a soil or waste pipe or with the drain, in such a manner as to prevent accumulation of rust scale and properly to drip the water of condensation. Offsets shall be made at an angle of not less than forty-five degrees. Soil pipes or iron waste pipes, vents and back air pipes, shall be supported by clamps to the woodwork, iron drive hooks to brick walls, or bolted clamps to iron girders.

All traps, except for water-closets, not provided with special air pipes shall be suitable non-siphon traps and shall have at least a four inch water seal. Round traps shall be not less than four inches in diameter and eight inches long, and made of eight-pound lead. All trap screws shall be water sealed.

*Chemical Laboratories.*

Fixtures and waste pipes in chemical laboratories shall be installed in accordance with plans approved by the commissioner.

*Stables.*

The drainage of stable fixtures shall be constructed according to plans approved by the commissioner.

SECT. 118. In buildings where a series of bathrooms or kitchens are located directly over each other and have a common soil or waste pipe, the back air pipe required shall be a vent line connecting with each outlet branch close to the water-closet connection or outlet from the sink trap, each branch vent to connect to vent line above the top of the highest fixture on each floor, the vent line to connect to main vent line above the top of the highest fixture in the building.

In the case of batteries of water-closets or other fixtures the special air pipe from each trap may be omitted, provided that the soil or waste pipe, undiminished in size, is continued to a point above the roof or reverted into the main soil pipe system above the top of the uppermost fixture.

The commissioner shall prepare explanatory sketches showing the method of construction described in this section.

*Refrigerator Wastes and Drip Pipes.*

SECT. 119. All drip or overflow pipes shall be extended to some place in open sight, and in no case shall any such pipe be connected directly with the drain pipe. No waste pipe from a refrigerator or other receptacle in which provisions are stored shall be connected directly with a drain or other waste pipe. The waste pipes from all other fixtures shall be connected directly with a drain pipe. Refrigerator wastes connecting with two or more stories shall be supplied with a trap on the branch for each floor and extended through the roof.

*Water-Closets, Etc.*

SECT. 120. Every water-closet or line of water-closets shall be supplied with water from a tank or cistern, and shall have a flushing pipe of not less than one and one quarter inches in diameter. Privy vaults shall be of brick and cement of a capacity of not less than fifty cubic feet, of easy access, convenient to open, and clean, and water tight. The inside shall be not less than two feet from the next lot and from any public or private way.

SECT. 121. The diameters of soil and waste pipes shall be not less than those given in the following table:—

	Inches.
Soil pipes, . . . . .	4
Main waste pipes, . . . . .	2
Main waste pipes for kitchen sinks on five or more floors,	3
Branch waste pipes for laundry tubs, . . . . .	1½
Branch waste for kitchen sinks, . . . . .	1½
Branch waste for urinals, . . . . .	1½
No branch waste for other fixtures shall be less than,	1½

Except that, with the approval of the commissioner, a three-inch soil pipe may be used for one water-closet where it is not practicable to use a four-inch pipe.

*Ferrules, Clean-outs, Etc.*

Brass ferrules shall be of the best quality, bell-shaped, extra heavy cast brass, not less than four inches long and two and one quarter inches, three and one half inches, and four and one half inches in diameter, and of not less than the following weights:—

Diameters.	Weights.
2½ inches, . . . . .	1 pound 0 ounces.
3½ " . . . . .	1 " 12 "
4½ " . . . . .	2 " 8 "

One and one half inch ferrules shall not be used.

Soldering nipples shall be of heavy cast brass or of brass pipe, iron pipe size. If cast, they shall be of not less than the following weights:—

1½ inches, . . . . .	0 pounds 8 ounces.
2 " . . . . .	0 " 14 "
2½ " . . . . .	1 " 6 "
3 " . . . . .	2 " 0 "
4 " . . . . .	3 " 8 "

Where clean-outs are used, the screw cap shall be of brass, extra heavy, and not less than one eighth of an inch thick. The engaging parts shall have not less than six threads of iron pipe size, and shall be tapered. Clean-outs shall be full size of trap up to four inches in diameter, and not less than four inches for larger traps.

The screw cap shall have a solid square or hexagonal nut, not less than one half inch high, with a least diameter of one and one half inches. The bodies of brass clean-out ferrules shall be at least equal in weight and thickness to the calking ferrule for the same size of pipe.

The use of lead pipes is restricted to short branches of the soil and waste pipes, bends and traps, and roof connections of inside leaders. " Short branches " of lead pipe shall mean not more than:—

- 5 feet of 1¼ inch pipe.
- 5 " " 1½ " "
- 4 " " 2 " "
- 2 " " 3 " "
- 2 " " 4 " "

The pipe shall be not less than the following average thickness and weight per linear foot:—

Diameters.	Thicknesses.	Weights per Linear Foot.	Diameters.	Thicknesses.	Weights per Linear Foot.
1¼ inches,	— —	2.50 pounds.	5 inches,	.25 inches,	14.50 pounds.
1½ " "	.14 inches,	2.68 " "	6 " "	.28 " "	18.76 " "
2 " "	.15 " "	3.61 " "	7 " "	.30 " "	23.27 " "
2½ " "	.20 " "	5.74 " "	8 " "	.32 " "	28.18 " "
3 " "	.21 " "	7.54 " "	9 " "	.34 " "	33.70 " "
3½ " "	.22 " "	9.00 " "	10 " "	.36 " "	40.06 " "
4 " "	.23 " "	10.66 " "	11 " "	.37 " "	45.02 " "
4½ " "	.24 " "	12.34 " "	12 " "	.37 " "	48.98 " "

Brass pipe for soil, waste, vent and back air pipes shall be thoroughly annealed, seamless, drawn brass tubing, of not less than number thirteen Stubbs gauge.

No slip joint or unions shall be used on traps, waste, vents or back air pipes. Threaded connections on brass traps shall be of the same size as pipe threads for the same size of pipe, and shall be tapered. Connections between lead and iron shall be made by brass sleeves or screw nipples wiped to the lead and calked or screwed into the iron.

The following average thicknesses and weights per linear foot shall be used: —

Diameters.	Thicknesses.	Weights per Linear Foot.	Diameters.	Thicknesses.	Weights per Linear Foot.
1½ inches,	.14 inches,	2.84 pounds.	4 inches,	.23 inches,	11.29 pounds.
2 "	.15 "	3.82 "	4½ "	.24 "	13.08 "
2½ "	.20 "	6.08 "	5 "	.25 "	15.37 "
3 "	.21 "	7.92 "	6 "	.28 "	19.88 "
3½ "	.22 "	9.54 "			

*Cast Iron Pipes, Etc.*

Cast iron pipes shall be uncoated, sound, cylindrical and smooth, free from cracks and other defects, of uniform thickness and of the grade known to commerce as "extra heavy." If buried under ground they shall be coated with asphaltum or red lead.

Pipe, including the hub, shall weigh not less than the following average weights per linear foot: —

Diameters.	Weights per Linear Foot.	Diameters.	Weights per Linear Foot.
2 inches,	5½ pounds.	7 inches (not stock size),	27 pounds.
3 "	9½ "	8 "	33½ "
4 "	13 "	10 "	45 "
5 "	17 "	12 "	54 "
6 "	20 "		

All joints shall be made with picked oakum and molten lead run full, and be made gas tight. No cement joints nor connections between iron and cement or tile pipe or brick drains shall be made within any building.

*Wrought Iron Pipe.*

Galvanized wrought iron pipe shall be of not less than the following thickness and weight per linear foot: —

Diameters.	Thicknesses.	Weights per Linear Foot.	Diameters.	Thicknesses.	Weights per Linear Foot.
1½ inches,	.14 inches,	2.68 pounds.	6 inches,	.28 inches,	18.76 pounds.
2 "	.15 "	3.61 "	7 "	.30 "	23.27 "
2½ "	.20 "	5.74 "	8 "	.32 "	28.18 "
3 "	.21 "	7.54 "	9 "	.34 "	33.70 "
3½ "	.22 "	9.00 "	10 "	.36 "	40.06 "
4 "	.23 "	10.66 "	11 "	.37 "	45.02 "
4½ "	.24 "	12.34 "	12 "	.37 "	48.98 "
5 "	.25 "	14.50 "			

The threaded part of the pipe if less than one and one half inches long, shall be of the thickness and weight known as "extra heavy" or "extra strong."

Fittings on wrought iron vent or back air pipes shall be galvanized, recessed, cast iron threaded fittings. Fittings for "Plumber's tubing" shall be heavy weight, with sharp threads.

Fittings for waste or soil or refrigerator waste pipes of wrought iron or brass pipe shall be galvanized, cast iron, or brass, recessed and threaded drainage fittings, with smooth interior waterway and threads tapped, so as to give a uniform grade to branches of not less than one quarter of an inch per foot.

All joints on wrought iron or brass pipe shall be screwed joints made up with red lead, and any burr formed in cutting shall carefully be reamed out.

*Drain Pipes, Etc.*

SECT. 122. Drain and connecting ventilation pipes, vents and back air pipes shall be of sufficient size, and made of extra heavy cast iron pipe if under ground, and if above ground shall be made of extra heavy cast iron, galvanized wrought iron of standard weight, or of not less than number thirteen Stubbs gauge brass pipe within the building, except that lead pipes may be used for short connections exposed to view. Cast iron drains shall extend not less than ten feet from the inside face of the wall, beyond and away from the building.

Drain pipes above ground shall be secured by irons to walls, suspended from floor timbers by strong iron hangers, or supported on brick piers. Proper man-holes shall be supplied to reach clean-outs and traps. Every drain pipe shall have a fall of not less than one quarter inch per foot, and shall be extended from a point ten feet outside the inside face of the wall, unobstructed, to and through the roof, undiminished in size, and to a height not less than two feet above the roof, and not less than one foot above the top of any window within fifteen feet, and not less than eight feet above the roof if the roof is used for drying clothes or as a roof garden. The drain pipe shall be supplied with a Y branch fitted with a brass clean-out or with an iron stopper, if required, on the direct run, at or near the point where the drain leaves the building. Changes in direction shall be made with curved pipes, and all connections with horizontal or vertical pipes shall be made with Y branches. Saddle hubs shall not be used. All drain pipes shall be exposed to sight within the building, if such exposure is practicable, and shall not be exposed to pressure where they pass through the wall.

*Steam Exhausts, Etc.*

No steam, or vapor, or water of a temperature over one hundred and thirty degrees Fahrenheit shall be discharged from any premises into any sewer, drain or catch-basin, nor shall any matter or thing be discharged into any sewer which may tend to cause an obstruction of the public sewer or a nuisance or a deposit therein or any injury thereto.

All high pressure steam boilers shall be connected with a blow-off tank of a capacity not less than thirty per cent of the largest boiler connected with such tank. The location of and the connections to said blow-off tank shall be subject to the approval of the superintendent of sewers.

No steam exhaust or steam drip, unless it be provided with a cooling tank of a capacity approved by the superintendent of sewers, or unless it be connected with the blow-off tank, shall connect with any drain leading to the sewer. Every blow-off tank shall be supplied with a vapor pipe not less than two inches in diameter, which shall be carried above the roof and above the highest windows of the building.

The superintendent of sewers may require such additional means for cooling the blow-off tanks by the injection of cold water or otherwise as may be necessary to reduce the temperature of the water passing from the blow-off tank so that it shall not exceed one hundred and thirty degrees Fahrenheit.

*Special Traps, Etc.*

SECT. 123. Every building from which, in the opinion of the superintendent of sewers, grease may be discharged in such quantity as to clog or injure the sewer, shall have a special grease trap satisfactory to the superintendent of sewers. Every building in which gasoline, naphtha or other inflammable compounds are used for business purposes shall be provided with a special trap, satisfactory to the superintendent of sewers, so designed as to prevent the passage of such material into the sewer, and ventilated with a separate pipe rising to a point four feet above the roof. All non-siphon traps shall be of a type approved by the commissioner. The waste pipe of every wash stand for vehicles shall be provided with a sand box of sufficient capacity.

The waste pipe from the sink of every hotel, eating house, restaurant or other public cooking establishment, shall be connected to a grease trap of sufficient size, easily accessible to open and clean, placed as near as practicable to the fixture that it serves.

*Roof Leaders and Surface Drains.*

SECT. 124. Rain water leaders when connected with house drains shall be suitably trapped and, within the proposed surface drainage area, shall not be connected at the top of the stack, nor extended down through the interior of the building, except by special permit from the commissioner. Wherever a surface drain is installed in a cellar or basement, it shall be provided with a deep seal trap and back water valve. Drain pipes from fixtures in cellars and basements liable to back flow from a sewer shall be supplied with back water valves.

## HAZARDOUS BUILDINGS AND APPLIANCES FOR POWER AND HEAT.

SECT. 125. No building shall be used for a grain elevator, or for the storage or manufacture of high combustibles or explosives, or for chemical or rendering works, without a permit from the commissioner, and no engine, dynamo, boiler or furnace shall be placed in any building without a permit from the commissioner. Every application for such permit shall be in writing, shall be filed with the commissioner, and shall set forth the character of the building, the size, power and purposes of the apparatus, and such other information as the commissioner may require. The commissioner may, after an examination of the premises described in the application, and after hearing the applicant and any objectors, issue a permit for placing a boiler or furnace on such premises, upon such conditions as he shall prescribe, or he may refuse such permit. If the application is for anything other than a boiler or furnace the applicant shall publish in at least two daily newspapers published in the city of Boston, and on at least three days in each, and, if so directed by the commissioner, shall also post conspicuously on the premises, a copy of the application, and shall deliver copies thereof to such persons as the commissioner may designate.

If no objection is filed with the commissioner before the expiration of ten days after the time of the first publication of notice, or within ten days of the delivery and first posting of the notice, if such delivery or posting is required, the commissioner shall, if the arrangement, location, and construction of the proposed apparatus is proper, and in accordance with the provisions of this act, issue a permit for the same. If objection is filed, the application shall be referred to the board of appeal, which may, in its discretion, require the deposit by the objector of a reasonable sum as security for the payment of the costs.

After such notice as the board shall order it shall hear the same, and shall direct the commissioner to issue a permit, under such conditions as it may prescribe, or to withhold the same. If the permit is refused, the applicant, and if it is granted, the objectors shall pay such costs as the board may order.

The commissioner may, from time to time, after public notice and hearing, prescribe conditions on which any or all boilers or furnaces may be maintained in buildings, and, if any person interested objects to such conditions and appeals from his decision establishing the same, the appeal shall be referred to the board of appeal, and thereupon said board shall prescribe the conditions.

## COMBUSTIBLE MATERIALS.

SECT. 126. No building adapted for habitation, nor any part thereof, nor the lot upon which it is located, shall be used as a place for the storage, keeping or handling of any combustible article, except under such conditions as may be prescribed by the fire commissioner. No such building nor any part thereof, nor of the lot upon which it is located, shall be used as a place for the storage, keeping or handling of any article dangerous or detrimental to life or health, nor for the storage, keeping or handling of feed, hay, straw, excelsior, cotton, paper stock, feathers or rags.

## ENFORCEMENT OF ACT.

SECT. 127. Every structure and part thereof and appurtenant thereto shall be maintained in such repair as not to be dangerous. The owner shall be responsible for the maintenance of all buildings and structures. The lessee under a recorded lease shall be deemed the owner under the provisions of this act.

POWERS OF THE BOARD OF HEALTH.

SECT. 128. The board of health may by vote limit the number of occupants who shall be permitted to dwell in any building or in any part or parts thereof. They shall cause a copy of any such vote to be served upon the owner of the building, his agent or other persons having the charge thereof. If the owner, agent, or other persons having charge of said building allow or permit more people than are permitted by said vote to occupy the building or any part or parts thereof, said board may order the premises to be vacated, and they shall not again be occupied without the permission of the board. The board may make such further regulations as to overcrowding, ventilation, the construction of water-closets, the lighting of hallways, and the occupation of buildings or parts thereof, not inconsistent with other laws, as they may deem proper. Said board may permit rooms in private stables to be occupied for sleeping purposes by grooms and coachmen.

ENFORCEMENT — JURISDICTION IN EQUITY.

SECT. 129. Any court having jurisdiction in equity or any justice thereof shall, upon the application of the city by its attorney, have jurisdiction in equity: —

To restrain the construction, alteration, repair, maintenance, use or occupation of a building, structure or other thing constructed or used in violation of the provisions of this act, and to order its removal or abatement as a nuisance;

To restrain the further construction, alteration, repair, maintenance, use or occupation of a building, structure or other thing, which is unsafe or dangerous;

To restrain the unlawful construction, alteration, repair, maintenance, use or occupation of any building, structure or other thing;

To compel compliance with the provisions of this act;

To order the removal by the owner of a building, structure or other thing unlawfully existing, and to authorize the commissioner, with the written approval of the mayor, in default of such removal by the owner, to remove it at the owner's expense.

Any person, the value of whose property may be affected by any decision of the board of appeal, may have the action of said board reviewed by the court by any appropriate process, provided that proceedings are instituted within thirty days after the date of such decision.

The person applying for the review shall file a bond with sufficient surety, to be approved by the court, for such sum as shall be fixed by the court, to indemnify and save harmless the person or persons in whose favor the decision was rendered from all damages and costs which they may sustain in case the decision of said board is affirmed.

In case the decision of the board is affirmed the court, on motion, shall assess damages, and execution shall issue therefor.

Any person having any duty to perform under the provisions of this act may, so far as may be necessary for the performance of his duties, enter any building or premises in the city of Boston.

JURISDICTION AT LAW.

SECT. 130. The municipal court of the city of Boston, concurrently with the superior court, shall have jurisdiction throughout the city of prosecutions and proceedings at law under the provisions of this act, and also of all provisions of law relative to plumbing and gas-fitting.

PROCEDURE.

SECT. 131. Upon the entry of any case brought under the provisions of this act the court shall, at the request of either party, advance the case, so that it may be heard and determined with as little delay as possible.

NUISANCE.

SECT. 132. A building or structure which is erected or maintained in violation of the provisions of this act shall be deemed a common nuisance without other proof thereof than proof of its unlawful construction, and the commissioner may abate and remove it in the same manner in which boards of health may remove nuisances under the provisions of sections sixty-seven, sixty-eight and sixty-nine of chapter seventy-five of the Revised Laws.

Whoever violates any provision of this act, or whoever builds, alters, or maintains any structure or any part thereof in violation of any provision of this act, shall be punished by a fine not exceeding five hundred dollars.

REPEALS.

SECT. 133. So much of chapter four hundred and nineteen of the acts of the year eighteen hundred and ninety-two and of all acts in amendment thereof as is unrepealed is hereby repealed. So much of any other act as is inconsistent herewith is hereby repealed.

SECT. 134. This act shall take effect upon the first day of August in the year nineteen hundred and seven. [Approved June 22, 1907.]



## AMENDMENTS TO THE BUILDING LAW OF THE CITY OF BOSTON (ACTS OF MASSACHUSETTS, 1907, CHAP. 550).

[ACTS OF MASSACHUSETTS, 1908, CHAP. 336.]

### AN ACT RELATIVE TO PASSAGEWAYS IN THEATRES.\*

*Be it enacted, etc., as follows:*

SECTION 1. Section one hundred and eleven of chapter five hundred and fifty of the acts of the year nineteen hundred and seven is hereby amended by striking out the word " passageway," in the fifth paragraph, so that said paragraph will read as follows: — No temporary seats or other obstructions shall be allowed in any aisle or stairway of a theatre, and no person shall remain in any aisle or stairway of any such building during any performance.

SECT. 2. This act shall take effect upon its passage. [Approved April 1, 1908.]

[ACTS OF MASSACHUSETTS, 1909, CHAP. 313.]

### AN ACT RELATIVE TO THEATRES IN THE CITY OF BOSTON.

*Be it enacted, etc., as follows:*

SECTION 1. Section one hundred and eleven of chapter five hundred and fifty of the acts of the year nineteen hundred and seven, as amended by chapter three hundred and thirty-six of the acts of the year nineteen hundred and eight, is hereby further amended by striking out the words " and landings," in the first line of said section, by striking out the second sentence in the third paragraph of said section and inserting in place thereof the words: — An emergency arc light or its equivalent shall be installed in the auditorium, which light or lights, exit lights, and all lights in halls, corridors, or any other part of the building used by the audience except the general auditorium lighting, shall be fed independently of the stage lighting and shall be controlled only from the lobby or other convenient place in the front of the house, — by inserting after the word " desk," in the eighth line of the seventh paragraph, the words: — or any other place easily reached from the stage level, — and by striking out the second sentence in the eighth paragraph and inserting in place thereof the words: — The said pipes shall in no case be sealed and shall have a gate and check valve and shall have a test valve placed between the gate valve and check valve, — so as to read as follows: — Section 111. All stairs of theatres shall have throughout proper hand-rails on both sides firmly secured to walls or to strong posts and balusters. Stairways twelve feet or more wide shall have one or more intermediate rails not more than eight feet apart and properly supported.

No boiler, furnace, engine or heating apparatus, except steam, hot water<sup>3</sup> or hot air pipes or radiators, shall be located under the auditorium nor under any passage or stairway or exit of any theatre.

In every theatre there shall be over every exit, on the inside, and over every opening to a fire-escape, on the inside, an illuminated sign, bearing the word " exit " or " fire-escape," respectively, in letters not less than four inches high. An emergency arc light or its equivalent shall be installed in the auditorium, which light or lights, exit lights, and all lights in halls, corridors, or any other part of the building used by the audience except the general auditorium lighting, shall be fed independently of the stage lighting and shall be controlled only from the lobby or other convenient place in the front of the house. Every exit sign shall be kept illuminated and every outside balcony and fire-escape shall be kept well lighted during the performance, except outside exits during a performance in the daytime and before sunset.

The exits and openings to fire-escapes of all theatres shall open outward and have fastenings on the inside only. They shall be unfastened during every performance and shall be so arranged that they can easily be opened from within. Plans showing the exits and stairways shall be legibly printed so as to occupy a full page of every programme or playbill.

No temporary seats or other obstructions shall be allowed in any aisle or stairway of a theatre, and no person shall remain in any aisle or stairway of any such building during any performance.

The proscenium or curtain opening of every theatre shall have a fire-resisting curtain of incombustible material, reinforced by wire netting, or otherwise strengthened. If of iron, or similar heavy material, and made to lower from the top, it shall be so arranged as to be stopped securely at a height of seven feet above the stage floor, the remaining opening being closed by a curtain or valance of fire-resisting fabric. The curtain shall be raised at the beginning and lowered at the end of every performance, and shall be of proper material, construction and mechanism.

There shall be one or more ventilators near the center, and above the highest part of the stage of every theatre, of a combined area of opening satisfactory to the building commissioner, and not less than one tenth of the area of the proscenium opening. Every such ventilator shall have a valve or louvre so counterbalanced as to open automatically, and shall be kept closed, when not in use, by a fusible link and cord reaching to the prompter's desk or any other place easily reached from the stage level and readily operated therefrom. Such cord shall be of combustible material, and so arranged that if it is severed the ventilator will open automatically.

There shall be at least two two-inch high-service standpipes on the stage of every theatre, with ample provision of hose nozzles at each level of the stage on each side, and the water shall be kept turned on during the occupation of the building by an audience. The said pipes shall in no case be sealed and shall have a gate and check valve and shall have a test valve placed between the gate valve and check valve. The proscenium opening of every theatre shall be provided with a two and one half inch perforated iron pipe or equivalent equipment of automatic or open sprinklers, as the commissioner may direct, so constructed as to form when in operation a complete water curtain for the whole proscenium opening, and there shall be for the rest of the stage a complete system of fire apparatus and perforated iron pipes, automatic or open sprinklers. Such pipes or sprinklers shall be supplied with water by high pressure service, and shall be ready for use at all times.

SECT. 2. This act shall take effect upon its passage. [Approved April 22, 1909.]

\* Amended. See Acts 1909, Chap. 313, on this page.

[Insert at Page 3a.]

## AMENDMENTS TO BUILDING LAW OF CITY OF BOSTON (ACTS OF MASSACHUSETTS, 1907, CHAP. 550), AND FURTHER ACTS RELATIVE TO BUILDING, IN THE YEARS 1910 AND 1911.

[ACTS OF MASSACHUSETTS, 1910, CHAP. 284.]

### AN ACT RELATIVE TO THE CONSTRUCTION, ALTERATION, INSPECTION, AND MAINTENANCE OF BUILDINGS IN THE CITY OF BOSTON.

*Be it enacted, etc., as follows:*

SECTION 1. It shall be the duty of the building commissioner of the city of Boston to enforce all provisions of law relative to the construction, alteration, inspection and maintenance of buildings which are or may be applicable to said city, heretofore enforced by the district police, except the provisions of chapter four hundred and sixty-five of the acts of the year nineteen hundred and seven, relative to the inspection of steam boilers, the provisions of chapter three hundred and seventy of the acts of the year nineteen hundred and four, as amended by chapter two hundred and eighty of the acts of the year nineteen hundred and five and by chapter five hundred and two of the acts of the year nineteen hundred and eight, relative to the keeping, storage, use, manufacture, sale, handling and transportation of explosive or inflammable fluids or compounds or other explosives, the provisions of chapter four hundred and thirty-three of the acts of the year nineteen hundred and four, relative to the powers and duties of the detective department of the district police in connection with the investigation or prevention of fires, and the provisions of chapter five hundred and fourteen of the acts of the year nineteen hundred and nine, and acts in amendment thereof or in addition thereto, relative to labor, so far as the provisions of said chapter are enforced by the district police.

SECT. 2. All acts and parts of acts inconsistent herewith are hereby repealed.

SECT. 3. This act shall take effect upon its passage. [Approved March 25, 1910.]

[ACTS OF MASSACHUSETTS, 1910, CHAP. 631.]

### AN ACT RELATIVE TO THE POWERS OF THE BOARD OF APPEAL OVER THE BUILDING DEPARTMENT OF THE CITY OF BOSTON.

*Be it enacted, etc., as follows:*

SECTION 1. Section six of chapter five hundred and fifty of the acts of the year nineteen hundred and seven is hereby amended by inserting after the word "disqualified," in the twenty-fifth and twenty-sixth lines, the words:— or is absent from illness or other cause, — so as to read as follows:— SECTION 6. There shall be in said department a board to be called the board of appeal. Said board shall consist of five members appointed by the mayor in the following manner: One member from two candidates, one to be nominated by the Real Estate Exchange and Auction Board and one by the Massachusetts Real Estate Exchange; one member from two candidates, one to be nominated by the Boston Society of Architects and one by the Boston Society of Civil Engineers; one member from two candidates, one to be nominated by the Master Builders Association and one by the Contractors and Builders Association; one member from two candidates to be nominated by the Building Trades Council of the Boston Central Labor Union; and one member selected by the mayor. These appointments shall be subject to confirmation by the board of aldermen. The appointments first made shall be for the terms of one, two, three, four, and five years, respectively, so that the term of one member shall expire each year. All subsequent appointments shall be for the term of five years. Vacancies shall be filled in the same manner in which original appointments are made. Each member of said board shall be paid ten dollars per day for actual service but not more than one thousand dollars in any one year. No member shall act in any case in which he is interested, and in any case any member is so disqualified, or is absent from illness or other cause, the remaining members shall designate a substitute.

All the members of said board shall be residents of or engaged in business in Boston.

Every decision of the board shall be in writing and shall require the assent of at least three members.

SECT. 2. This act shall take effect upon its passage. [Approved June 15, 1910.]

[ACTS OF MASSACHUSETTS, 1911, CHAP. 342.]

### AN ACT TO REGULATE THE CONSTRUCTION OF GARAGES IN THE CITY OF BOSTON.

*Be it enacted, etc., as follows:*

SECTION 1. A garage hereafter erected within the fire limits of the city of Boston shall be of first-class construction. A garage hereafter erected in any other part of that city shall be either of first or second class construction.

SECT. 2. By the term "garage" is meant a building or that part of a building wherein are kept five or more automobiles or motor cars charged with or containing a volatile inflammable liquid for fuel or power. Wherever hereafter any part of an existing building is converted into a garage, the garage shall be deemed to embrace all the building not separated from the garage proper by fireproof construction satisfactory to the building commissioners, and such building or part of a building shall be of first-class construction.

SECT. 3. By the term "volatile inflammable liquid" is meant any liquid that will emit inflammable vapor at a temperature below one hundred degrees Fahrenheit, when tested in the open air.

SECT. 4. The penalty for violation of this act shall be a fine of not less than ten and not more than fifty dollars a day, so long as the violation continues. [Approved April 27, 1911.]



## Building Limits of City of Boston

" The building limits . . . are established as follows: All that portion of the city which is included within a line beginning at the intersection of the center lines of Dover and Albany Sts., and thence running east through the centre of said Dover St. to the harbor commissioners' line; thence by the said harbor commissioners' line around the northerly portion of the city to a point on Charles River at the intersection of said line with the easterly line of St. Mary's St. extended; thence along said easterly line of St. Mary's St. and the boundary line between Brookline and Boston to the center of Longwood Ave.; thence through the centre of said avenue to the center of St. Alphonsus St.; thence through the centre of said street to the centre of Ward St.; thence through the centre of said Ward St. to the centre of Parker St.; thence through the centre of said Parker St. to the centre of Ruggles St.; thence through the centre of said Ruggles St., to the centre of Washington St.; thence through the centre of said Washington St. to a point opposite the centre of Palmer St.; thence through the centre of said Palmer St. and through the centre of Eustis St. to the centre of Hampden St.; and thence through the centre of said Hampden St. and the centre of Albany St. to the point of beginning; the said district being shown on a plan made by the city surveyor, dated June 28, 1881, and deposited in the office of the city engineer." — *Chapter 45, Section 27, Revised Ordinances of 1893 of the City of Boston. 1908. Twelfth Revision. Sixth Edition.*

### Extracts from Revised Ordinances and Regulations of City of Boston, 1898. 1908 Edition

ORDINANCES, CHAPTER 47, SECTION 51. No person shall make any permanent excavation under the surface of a street, the inner face of the wall of which extends further under the street than to a line eighteen inches inside the line of the outer edge of the curb-stone or sidewalk.

SECT. 52. No person shall place or maintain in a street any grating which extends more than eighteen inches into the street, or the spaces between the bars of which are more than one inch in width.

SECT. 53. No person shall make a coal-hole or other opening in a street, except in accordance with a permit from the superintendent of streets.

SECT. 54. No person shall maintain an entrance to his estate by steps descending immediately from or near the line of a public street, unless the same is securely guarded.

REGULATIONS, CHAPTER 6, SECTION 32. No person shall project a bay window over any street less than thirty feet in width unless another bay window already projects over such street; no person shall project a bay window more than eighteen inches over any street unless another bay window already projects more than eighteen inches over such street, and no person shall in any case project a bay window more than three feet over any street.

SECT. 33. No person shall place or maintain any projection over a street beyond a line two feet six inches within the outside line of the sidewalk, or which shall at its lowest part be less than seven feet six inches above the grade of the sidewalk, or which in other particulars is not in accordance with a permit from the superintendent of streets.

ORDINANCES OF 1902, CHAPTER 3. Chapter 8 of the Revised Ordinances of 1898 is amended by adding at the end thereof the following:

Said commissioner may issue permits for bay windows to project over public streets, but no bay window shall project more than is authorized in an order of the Board of Aldermen, shall not project over a street thirty feet or less in width unless there is a bay window thereon when the permit is issued, and then not more than eighteen inches, and shall not project over any other public way more than three feet.

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#### THE FOLLOWING STATUTES ARE REFERRED TO ON PAGE 11

Acts 1898, Chap. 452. An Act relative to the Height of Buildings on and near Copley Square, in the City of Boston.

Acts 1902, Chap. 543. An Act relative to the improvement of the State House and to the Height of Buildings on Beacon Street and Bowdoin Street, in the City of Boston.

Acts 1905, Chap. 383. An Act relative to the Height of Buildings in the City of Boston.

Acts 1907, Chap. 416. An Act relative to the Height of Buildings on Rutherford Avenue, in the City of Boston.

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**BUILDING COMMISSIONER . . . . . ARTHUR G. EVERETT**  
**15 OLD COURT HOUSE, BOSTON**



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COMPILED AND ARRANGED BY WILLIAM ATKINSON, F. B. S. A.

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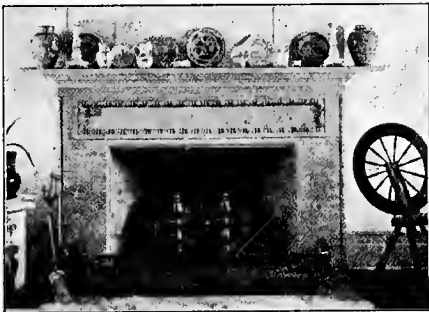
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