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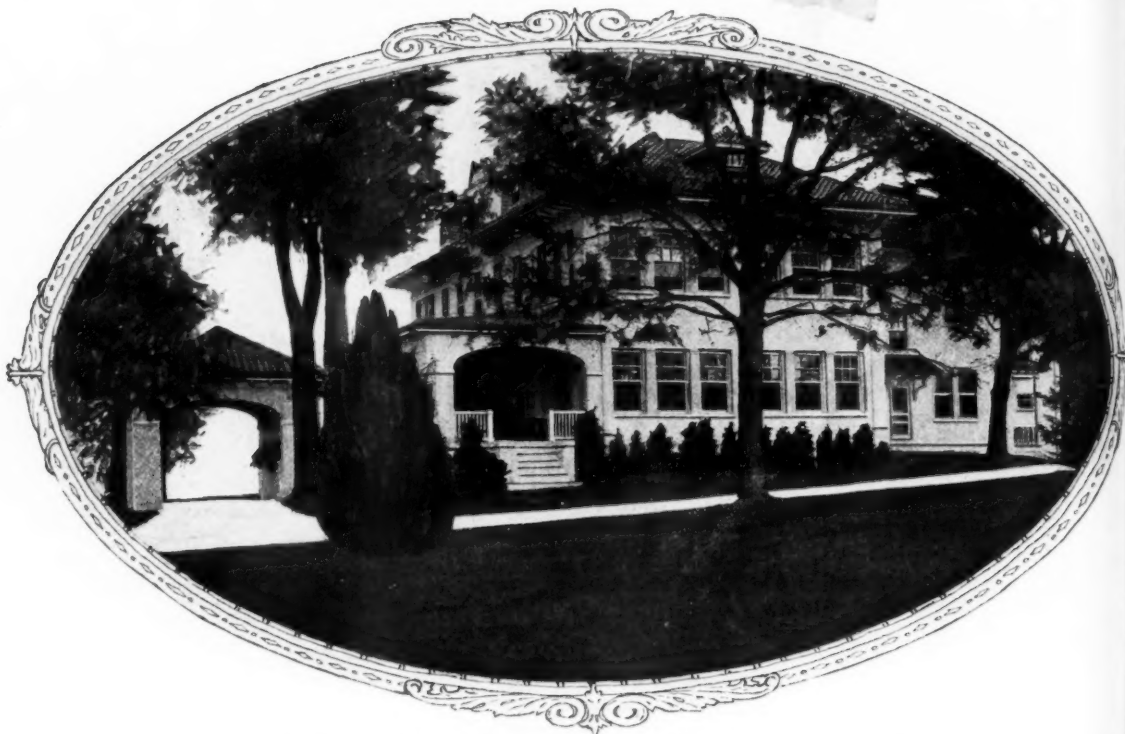
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The Investment Problem in Office Buildings*

By EDWARD A. RENWICK, of HOLABIRD & ROCHE, *Architects and Engineers*

IN the above title "investment" is understood to be an adequate financial return upon the capital invested in an enterprise. It is not always possible to foresee all the elements which may make an office building successful, but with proper study by experienced persons the result may be predicted with considerable accuracy.

An analysis of the failures show as principal contributing causes the following items: Improper location, initial underestimate of cost, faulty or insufficient financing, wasteful or thoughtless planning, unstudied returns, extravagant construction or finish, low grade of workmanship or materials, inflated land value, lack of individuality or attractiveness of exterior.

In the case of many such failures, if the owner had consulted someone thoroughly experienced in such matters before purchasing the property or entering upon a long-time lease, or before erecting the building upon property already acquired, better results would have been attained or the property developed with a building for other purposes.

A person with broad experience in the construction and renting of office buildings will, in seeking for the best solution of the problem for each site, consider thoughtfully and consistently the following questions: Will the site be developed to its highest and most permanent use by an office building? Will the returns justify the cost of an office building that will remain a good investment? How many stories high may the building be constructed without danger of excessive vacancies? Will the store rentals be adequate to meet their proportion of the expense of interest, taxes and insurance? What character of building will be required to meet best the demand for space and at the same time not be outclassed by newer office buildings?

The first step, after it is considered advisable to build an office building, is to make a thorough and careful study of the local requirements of tenants. It will be found that these requirements are subject to considerable variation in different cities, due to some degree to the various methods of conducting business; the seclusion, or the converse, of heads of corporations or firms; the volume of business conducted by the individual tenants; customs as to size of office units, etc. Prevailing winds of the cities that have high temperatures in summer should be given consideration in the selection of sites, placing of courts and arrangement of windows. Generally it is not advisable to attempt to modify local preferences but rather adapt the plan to meet the problems.

One should study the existing rentals in the locality of the site to determine the probable success of the proposed building. In many cases these rentals may seem inadequate. An examination of the premises may show that the store fronts are not as well designed as they should be, that the office plans or the finish and equipment of the building are unsatisfactory, but that in a proper building higher rentals could be obtained. If the proposed building is located in a district occupied by low-grade tenants, such tenants will be a serious handicap to the stores in the new building and might cause the project to become a failure. By advising the owners of property in the district to form an association and terminate such leases, remodel store fronts, increase the street lighting and generally improve the character of the district, inducing high-grade tenants to locate in the remodeled buildings even if the rental for the first few years is not adequate, the value of the land will, in a few years, be enhanced and a better class of tenants attracted to the office floors. High office rentals cannot be expected or obtained where the

*An address delivered before the convention of the National Association of Building Owners and Managers.

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tenants of stores cater to the cheaper trades, or where the majority of the people on the street in the immediate vicinity of the office building are of an objectionable character. Saloons, pawnshops, penny arcades, cheap clothing, shoes, second-hand and fake jewelry stores, and others of similar character, destroy rental and land values, and only by the owners making a combined effort with some temporary loss can depreciation be checked.

The plan of the building should have the best possible column spacing for both offices and stores. In a building ten or more stories in height the spacing for offices should take preference over that for stores, as the combined square foot net rental of the office floors is generally greater than the net rental per square foot of the stores. The best width and depth of offices should be determined. Numerous studies of the typical upper floor plans should be made to obtain the maximum rental of perfectly and permanently lighted space, with the minimum of building area of the typical floor. These studies should be analyzed by percentages to compare results. In making such studies, consideration should be given to the effect of climate, prevailing winds, sun, air, light, width of street, expanse of parks, water or other natural conditions affecting light in offices, and also to the requirements of the possible occupants.

It has been found that offices facing the lake on Michigan Boulevard in Chicago can be well lighted to a depth of over 30 ft. by the reflected light from the water, this light being nearly horizontal; and advantage has been taken of this condition in the planning of certain buildings.

Before determining on the plan, consideration must be given the location of elevators, stairs and public utilities and the extent of public corridors. The plans should permit the entire floor to be thrown into one unbroken space for tenants requiring such space. The ability to cut off large, unbroken areas for single tenants is desirable, as it saves corridors, increasing the renting areas and reducing initial cost, and also reduces the operating expense. The location of the court, or courts, is of vital importance; generally one large court is better than two or more smaller ones. The building should have such ample courts that the light would still be very good should buildings of equal or greater height be erected adjoining the site. The custom of depending on the light from an alley which is 16 ft. or 18 ft. wide is objectionable, for ample light in such a case is impossible if the building opposite is high, or if such building should be built in the future. A good plan will combine the alley and court, thus increasing the light and air.

Interior columns should be placed near the corridor lines to facilitate subdivisions into larger than unit spaces. The window arrangement should be such that every square foot of rentable space will be perfectly lighted, and the windows should be divided by mullions and piers so arranged that the greatest flexibility in subdivisions may be possible.

Having secured the best office and store plan, the building manager and architect should make very conservative estimates of the cost, returns and expenditures of the building to determine its possible return on the investment, after making due allowance for carrying charges during construction, probable taxes, insurance, vacancies and depreciation, etc., thus to inform the owner as to its desirability as an investment. One building which proves a failure financially does much harm to the building industry and offsets the effect of a number of successful buildings, for the public does not, or is not able to, recognize the causes of failure. Careless, incompetent or deliberate underestimates of costs and operation or overestimates of returns should be discouraged.

The exterior treatment of an office building presents difficult problems to an artistic designer. Commercial requirements necessitate a repetition of almost standardized openings for windows with uniform floor levels, and notwithstanding these conditions the really successful exterior must have individuality, together with a certain charm and grace—all without undue expense. It should harmonize with its surroundings. There should be but one entrance to the ordinary office building, and this in the case of a building on a corner lot should be on the street best suited for office purposes. The street where lower store rentals are obtained generally is best adapted for the entrance, thus reserving the space on the other street, if a building is on a corner lot, for income. The entrance should lead directly to the elevators without change of direction. The entrance feature should be accentuated, but if possible without too great sacrifice in the rentable space of the first and second stories. When the second story is used for banking purposes, the first story should be not more than 12 or 13 ft. high and the stairs should be so located that they will lead naturally from the entrance to the banking floor.

Excessively expensive exteriors should be avoided, as they may seriously affect the success of the building by their effect on the net returns through increased investment, taxes and depreciation charges, which must be borne by the rentals. This should not be interpreted to mean that the exterior should be severe and cheap, but individuality should be obtained by economical treatment.

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The foundations ought to be so designed that all settlement of the structure will be avoided, and they must be ample properly to support the building. If tunnels or other deeper structures are or will be installed, the foundations should be so designed that they will be undisturbed.

The question of the advisability of equipping the building with a power and lighting plant is one of great importance. In general, if current from a public utility corporation can be obtained at a reasonable rate for power, it is better to eliminate the power plant, operating the elevators by electricity and allowing the tenants to buy their current for lighting. There are buildings in which the owners claim that their plants show a good profit through the sale of current to the tenants, but these are exceptions, and for each building of this kind there are certainly two or three to be found where the power plants have been shut down and current is now supplied by the Public Utility Corporation. By the omission of the plant the initial cost is reduced, expensive operation, labor troubles, breakdowns and difficulty in obtaining sufficient coal are avoided and depreciation reduced. This portion of the building is subject to very rapid depreciation, as has been shown by long experience.

The elevators are of great importance to the success of the building. The number should be sufficient for the peak load, but this peak load is subject to great variation caused by the character of the tenants. Those tenants who occupy large spaces and have a large clerical force, such as railways, large manufacturers, school boards, etc., seriously affect elevator service. Unless arrangement can be made between owner and tenant, providing that the employees leave and arrive, particularly at the noon hour, in regulated relays, the elevators, which during practically all other hours of the day are more than ample, may become inadequate. This always reflects on the minds of the public and affects the reputation of the building. The use of the upper floors for clubs, particularly lunch clubs, has this same effect. Elevators should have good speed, be equipped with signals to reduce stops to a minimum and thus conserve both time and current. The elevator cabs should always be at least as wide as they are deep, and, if possible, from 20% to 50% wider. The doors should open to two-thirds of the width of the cab. This insures quick filling and emptying of cabs, conserves time and thus reduces the total of service. For the ordinary office building cabs that will hold twelve to fourteen people will show the best results, rather than larger or smaller cabs. Thus the cabs will have from 28 to 32 sq. ft. of area inside measure-

ment arranged 4' 8" deep by 6' 0" to 4' 8" deep by 7' 0" wide.

The interior treatment of the building, to a large degree, determines its character and also its worth as an investment. The building that has durable finish and is a little better finished and equipped than its neighbors will not be outclassed so rapidly by newer structures, and will have a longer commercial life. The tenant is affected mostly by the appearance of the elevator lobby, corridors, public utilities and finish of his offices, the character of the plumbing and heating, arrangement of lighting outlets and convenience to elevators, stairs and public utilities.

The investment problem becomes largely the deciding factor in the equipment of the interior of the building. It is here that success or failure is often determined, and this also has much to do with the commercial or useful life of the building.

The rentals obtainable in a locality must be the deciding factor in selecting the finish of the building. Certainly the standard of finish of a building where \$1.25 to \$1.50 per sq. ft. is to be expected must be lower than where higher rentals prevail. There is a simple rule that governs most successful buildings. The rentals of the first story and basement should pay the taxes on the land, 5% interest on the land (or the ground rent in case of a long lease) and the insurance on the building as a minimum. It will then appear that when this minimum only is obtained the upper stories must be leased for \$1.25 per sq. ft. to pay a small return on the most economical building possible. This seems a fair rule, as an analysis of rentals will show. On various streets in cities where first story rentals vary greatly, the office rentals remain usually about the same and the high first story rentals occur where the land value is highest. With this rule in mind the importance of determining the probable rentals of the first story of a proposed building becomes evident, and the necessity of a study of the interior treatment with relation to the rentals expected.

Some of the vital elements of the interior treatment are: Number of elevators, location of public toilet rooms, treatment of corridors, character of plumbing fixtures, heating system, floor treatment and kind and finish of woodwork.

The number of elevators depends on the total square feet of renting space above the first story, modified by the class of tenants and the relative size of the offices; the maximum number should be based on 20,000 sq. ft. of renting area per elevator and the minimum on 27,000 sq. ft. In both cases this only applies where the total renting area exceeds 60,000 sq. ft. The height of the building

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also affects this rule. The building should have not less than two elevators regardless of the total renting area, so that in case of a breakdown of an elevator the service will not be greatly impaired.

The location of public toilets has been a cause of much discussion. Shall they be distributed on the various floors of the building or concentrated upon one or two floors? Economy in initial cost favors the combined arrangement, and certainly ease of supervision with greater cleanliness favor this method. It means a slight increase in elevator service and perhaps may create some objections on the part of tenants.

Generally the centralized arrangement requires less sacrifice of renting area than the distribution arrangement and does not interfere with the flexibility of subdivision of space on the various floors.

The treatment of corridors is of great importance, not so much from the tenants' point of view as from that of initial cost and expense of upkeep. Certainly a well-furnished and artistic first story elevator lobby is desirable, and gives a distinct character to the building. On the typical floors the finish should be designed for attractiveness, cleanliness and economy of janitor service. Comparing buildings in New York City with those of the West, one is impressed with the greater economy in the upper floors obtained in New York City. We of the Middle West have been more extravagant in this regard. With the certain increase in the cost of buildings for many years to come, together with the probable increase of cost of operation, economies must be practiced, and at the same time the results must not appear cheap. Here is a field for study and thought for designer and manager.

The plumbing fixtures must be of the best materials and the working parts substantial and durable. Cheaply made plumbing fixtures become expensive to maintain, depreciate rapidly and greatly lower the character of the building. Vitreous earthenware is now universally used, but high-grade faucets, operating valves, toilet seats and working parts should be sought in selecting the equipment. Controlling valves on risers, perfectly covered hot and cold water pipes, shutoff valves on independent fixtures and return circulating pipes on hot water supplies all reduce complaints of tenants and become good advertising features in the building.

The heating system must be ample and with radiators of small units, giving easy control of the heat in the milder days; a vacuum system that causes the steam to circulate rapidly in the radiators, and substantial valves with controlling valves on each riser, are all essential. The use of thermo-

static valves is a luxury and desirable if the rentals warrant the expense.

There is one great economy that may be effected in construction, and it is becoming more general each year, and that is the use of highly finished concrete floors, thus doing away with the expensive wood floors and reducing the cost of upkeep. The most serious objection is the cost of changes in lighting and plumbing and the effect of patches where the floors must of necessity be cut for such changes. These floors are more fireproof and sanitary.

The kind of woodwork and its finish do much to give character to the building. It has been found that gum wood stained dark to match mahogany or Circassian walnut is very economical, and with genuine mahogany or walnut panels in the doors produces wonderful effects. Where rentals will permit, all woodwork should be done by high-grade cabinet makers, to avoid opening joints, warped trim, base, architraves, etc., common to even good millwork erected on the building. The custom of using metal doors and trim is becoming more common, and the tendency of the ordinances in the larger cities is to demand an increase of fireproof requirements in buildings. Where rental will permit their use, a wise owner will anticipate these requirements.

The question of the treatment of upper corridor partitions is one on which taste varies. Shall these partitions be carried to the tops of doors or shall the glass be brought to three or four feet from the floors? The former gives the tenant more privacy and makes the corridors more uniform in appearance, but with considerable loss of light and some distinct loss of advertising space. Both have merits and, as far as initial expense is concerned, do not vary greatly.

One notes in the smaller cities a tendency on the part of owners to compete with the office buildings of the larger cities in expensive finish and equipment, and in some very marked cases to experiment with the new and untried building devices that experienced owners generally avoid. Most of such additions increase the cost, as well as the maintenance, without a corresponding increase in rentals, where rentals are low in any event. The result is a monument to pride or ambition and not an investment.

It is the province of the building manager to study the cost of operation and to obtain the best results with a minimum of expense. This item is of so much importance in the investment problem that it must be discussed here. The cost of coal, supplies and labor has advanced greatly during the war and possibly never will return to the pre-war basis. Therefore, every effort should be made to

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reduce unnecessary expenses and make the employees more efficient. The entire building must be kept clear, the service must be such that tenants will wish to renew their leases, otherwise the character of the building will depreciate, with attendant lowering of rentals.

There are two features in connection with buildings built for investment which have received too little consideration from owners: Carrying charges and depreciation funds. The average architect in making his estimate of the cost of the building does not include carrying charges during construction, primarily because these depend on the value of the land and method of financing. Carrying charges are made up of the following: Taxes on the land during construction, ground rent (if on a long-term lease), insurance on building and interest on investment during construction, real estate commissions, commissions on loans, if any, loss of rental for first year and legal expenses. If the building is financed on a leasehold, with a serial bond issue, the carrying charges may easily approximate 10 per cent of the cost of the building, and its oversight may mean the difference between success and failure of the enterprise.

The second item is depreciation. An examination of the older buildings in any city will convince almost any one that the economic or commercial life of such buildings has not exceeded forty years. Many of us feel that with the advent of the modern skeleton construction, which had its birth in Chicago in 1887, the climax has been reached in construction and that these buildings will last at least one hundred years—physically they may last two hundred, but it is doubtful if they will have great economical value when forty years old. Mr. Bryan Lathrop, whose memory we all revere, once remarked: "The future is much wiser than we ever can be."

Every year we see buildings twenty-five to thirty-five years old being replaced with new structures because their commercial life has ended. Some of these when built were the best that could be pro-

duced with the engineering and architectural talent of the day, but new devices and methods of construction or changes in business requirements have destroyed them as competitors against more modern buildings. There are a number of modern fire-proof buildings that have been taken down to make room for larger or different classes of buildings, because these removals made the land more productive by the change, even though the cost of the original structure was added to the value of the land. Of course, had the owner been wise enough to have foreseen the new requirement and designed the building so it could readily have been converted to a new use, its commercial life would have been extended, but such provision would have added a considerable burden to the cost. How can we best provide against this economic loss? The answer seems to be to set aside a sum for depreciation annually and invest it and its accrued interest in safe securities. The average owner feels that this depreciation will be offset by the increase in the land value, but to benefit by such increase a sale must be made. Would it not be far wiser to set aside a fund and invest it in 4 per cent securities so that, where serious changes are required to prolong the life of the building, the funds will be at hand to do so, thus reviving the economical life and checking the rapid depreciation with consequent lowering of the character of the tenants. If a sum equal to 1 per cent of the cost of the building is so set aside annually and invested at 4 per cent and the interest reinvested at 4 per cent it will equal the cost of the building in forty years.

The increased cost of building material and labor and also the increase in cost of operation, together with higher taxes which will continue after the war, must react on rentals. Owners will demand, and tenants must pay, increased rentals. At first this may be difficult to accomplish, but the public will soon accept the new standards when the demand for office space exceeds the supply. When higher rentals have been firmly established capital will again be attracted to building investments.



High-Class Apartment Buildings as Investments*

By B. H. MARSHALL OF MARSHALL & FOX, *Architects*

FIFTEEN years of experience in both building and operating the highest class of apartments have taught some things which may be helpful to owners and managers considering this type of apartment as an investment. We know that such buildings, if properly located, designed and operated, are not only a safe and excellent investment, but one in which the owner can have much pride and from which he can obtain much pleasure.

There are three problems that must be solved to produce a high-class apartment building that will be entirely successful. They are: First, where to build; second, how to design and construct; third, how to operate.

The first problem, that of the location, must be considered carefully. Select a place which is good to-day and will be better to-morrow. Boulevard, lake or park frontage is most desirable. A combination of these on a corner, with southeast or southwest exposure, is by far the best. Such a location, in a part of the city which will meet with the approval of the class of tenants required, could not be bettered.

Light and sunshine are important elements to be considered in picking the location. Every room must get lots of light and positively half of the bed-chamber, all if possible, must have direct sunlight. Noise from automobile and other street traffic may be objectionable and must be thought of when arranging the bed-chambers. They should be as far from such cause of annoyance as possible.

The question of ordinary transportation is of minor importance, as it is used by only the servants. The tenants themselves will have their own motors and consequently need to be located on or very near a boulevard artery.

The second problem, that of how to plan and build this type of apartment, is probably the most difficult to solve. The plan must contain all the good features of a well-designed house, together with the numerous advantages made possible by apartment dwelling. The majority of the tenants come from their own homes and also live in a house in the country a part of the year, so it is essential to give them all they are accustomed to, plus every possible convenience resulting from community life.

*Read before the convention of the National Association of Building Owners and Managers, Chicago, June 21, 1918.

All large apartments consist of three distinct and separate parts, which parts may be called for convenience: public, private and service.

The living, or front part, contains the reception hall, the living room, the dining room, the breakfast or sun room and the library. These rooms, with the exception of the library, should open into each other so as to make as good an arrangement for entertaining purposes as for general living. A small but important room which is rarely found except in the very best of private homes is the dressing or coat room for the use of guests. This room in an apartment must open from the reception hall, as near the entrance door as possible. Too often guests arrive when it is awkward to take them into the private part of the apartment.

The private or chamber part of the plan should have a large rectangular hall, off which open all of the bedrooms. This hall, which connects directly with the reception room, should be so designed and so arranged that it can be used as an informal sitting room. Each bed-chamber must be provided with a large clothes closet and connect directly with its own bath. This bath must have good light and should be large enough to contain a dressing table in addition to the regular fixtures. In connection with one or two of the master chambers a large, light dressing room should be provided, fully equipped with cases and drawers to meet every demand of the tenant.

The sewing and linen room and a large storage closet should be located between this part of the apartment and the service quarters, so that ladies of the apartment can reach it without passing the servants' rooms and the servants reach it without coming into the private part.

The service or rear part of the house must connect directly with the reception hall, dining room and chamber hall. The number of servants' rooms should equal the number of master chambers. This conclusion has been reached after years of close contact with tenants. The worst feature in most apartments in regard to this part of the house is that the kitchen—the most important workroom—is also the most traveled passage. This should not be; the servants' dining room and butler's pantry must be so arranged that they can be reached without going through the kitchen. The architect,

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in designing the service end of the apartment, must always study with great care the most economical arrangement of the elements; where to place the refrigerator, the vault, the storage closets, the stove, the sink and the work table, and what to do to make the service operate smoothly and with the fewest steps possible.

There are a number of details pertaining to the construction which need to be considered. The question of deadening sound is a difficult one. In most apartments sound will travel by means of the partitions, floors and columns from one apartment to the next. As the result of several experiments a scheme has been evolved whereby the ceilings of the rooms are lowered and rest on the partitions. These partitions support this false ceiling and do not connect with the floor above, so there is absolutely no direct connection with the next apartment and consequently the sound vibrations cannot travel out of the apartment. The elevator is the cause of objectionable noise and a bed-chamber must never be placed next to the elevator shaft. If it is, there will be serious complaints as long as the building stands.

The installation of the plumbing is one of the most important of the minor things, because if it is not done in the right way at first it will do everything in its power to increase the operating expense. Plumbing repairs can very easily run into big figures. The fixtures in the bathrooms should be arranged so that they rest against the wall of a pipe shaft. Then repairs to a pipe or the changing of a fixture can be done at any time without taking up the floor or breaking into the wall, which work in a tile bathroom means a great deal of unnecessary expense. No steam or supply pipes or pipes of any kind should be buried in the floors or walls. Trouble always occurs at the places most difficult to reach. Never place any pipe, radiator, fixture or mechanical device where it is not easily accessible.

The size and location of the coal bin are too often neglected. The bin should be large enough for one-half year's supply and arranged so that the coal wagons can drive over the bin and dump the coal directly into the bin through manholes properly spaced to avoid any necessity for trimming. The ideal location for the boiler is in a sub-basement, so arranged that the coal will feed into the grates and save the labor of carrying.

Such points as these which have just been mentioned, if taken into consideration at the time of construction, will make a tremendous saving in the yearly cost of operation. It is believed that fully 10 per cent of the cost of operation in apartments is wasted because insufficient thought was given to such things at the time of construction. In the

future there will be such a shortage of help that these items will become of primary importance.

In the operation of a high-class apartment building every effort must be made and every cent spent with the one thought in mind—to give the tenant the best service that is to be had. The question of expense must be secondary to this idea.

The subject of operation divides itself into such headings as: First, the number of employees and their duties; second, the question of repairs; and third, the purchase of fuel and supplies.

A building of this type, containing eight to ten apartments, will need, for the best service, from eight to ten employees. There should be a superintendent or head janitor who lives in the building and has entire charge. He must be a man who not only has the knack of keeping his tenants happy and satisfied, but also one who has a broad general knowledge along engineering, mechanical, electrical and other lines. The janitor can, by keeping everything in first-class condition and insisting that all repair work be done at once, more than save his salary. In addition to overseeing all the work done throughout the building, he employs the men and does a part of the firing and helps with the cleaning of the public halls and corridors.

In apartments of this type every employee should wear a special uniform and so appear and act that any tenant, no matter whether he meets him carrying refuse from the rear door or in quiet, dignified livery in the front elevator, will feel that this man belongs to the building, is working for his interest and comfort, and is the same as one of his own servants.

The total yearly payroll in relation to the annual income runs higher for the same kind of service in a small apartment building than in a large one. It is interesting to note from the records that the relation of payroll to income is about 3 per cent higher in an eight-apartment building renting for about \$5,000 a year each than in a ten-apartment building renting for about \$7,800 a year each. The payroll will be about eight per cent of the income.

Repairs on buildings of this character are one of the largest items of operation. This term includes all necessary plumbing, carpentry, mechanical, electrical and general repair work in addition to painting, refinishing of floors and care of the woodwork. By a system of records every repair expense is charged up against the building or against the apartment in which the repair is made. In this way one can tell if more work is being done in a particular apartment than should normally be the case. Where such cases arise investigation can easily be made and the real cause of such disproportionate expenditure be found.

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The feasibility of employing a head superintendent for all our buildings is under consideration and having under him a special carpenter, electrician and plumber. This scheme has its possibilities and it is believed it would make a material saving if put into operation. This scheme works out in large office buildings and hotels and it would, it is thought, be economical for the high-grade apartment building. It is certain that with a special man for repairing each line of work, whose business it has been to take care of that work in an apartment building, there will be a visible decrease in the repair bills.

Another way to help keep down the cost of operation is to handle properly the purchase of fuel and janitors' supplies. A close record is kept of the fuel consumption, by having the janitors turn in reports at the end of each month stating the quantity of coal used each day, together with statistics as to temperature and wind. The material obtained from these reports is recorded, so that at the end of the year we have a check on the quantity of coal purchased and consumed. It also gives an interesting comparison as to the consumption of coal in the various buildings and the efficiency of the different heating plants and janitors.

The cost of janitors' supplies, although a small item, is kept as low as possible by purchasing them wholesale and keeping the reserve in a storage room.

It has been found quite valuable to keep a record in chart form of all operating expenses, listed under the following heads: Payroll, electric light and power, water, fuel, gas, cartage, flowers, supplies, repairs, painting, incidentals, insurance, taxes and agent's commission. A separate heading is kept for physical improvements, which expense is added to the original value of the building. When the monthly expense of each of these items is plotted on a sheet over a period of years it enables one to tell just where every cent has been spent and shows graphically if any phase of the operating expense is larger than it should be.

The total cost of operating in relation to the total income varies a great deal, according to the size of the building, the size of the apartments and the number of apartments. For very high-class service it is much more expensive per dollar income to operate a small building with say six or eight apartments than to operate a larger one of ten or twelve apartments. The quality of service has to be the same in both buildings and an increase in the number of apartments does not make a proportionate increase in the cost of operation. It has been found that the cost of operation will vary from 30 to 40 per cent of the total income.

This type of apartment is undoubtedly one of the very best kinds of investments. The location will

be such that the value of the land will increase year by year. The fact that the apartment has been built on a certain lot will increase the value of surrounding property and thus benefit itself.

A large fireproof apartment, built of the best materials throughout and finished in the most thorough and up-to-date manner, will depreciate in value much less rapidly than a cheaper building; especially small apartments of non-fireproof construction. The depreciation in ordinary apartment buildings results in the highest rentals being obtainable only when the building is new. As the buildings depreciate in value the rentals decrease. In buildings of the type under consideration it has been found that the contrary is true. One particular building erected twelve years ago has been able to increase its annual rental \$1,000 for each apartment. In each of our buildings five-year leases are written and at the renewal of these leases it has always been possible to increase the rents. Further, the total operating expense stays the same year after year. This is not true of the cheaper apartments where the cost of repairs and upkeep increases with the age of the building.

Consequently, it is safe to assert that such an investment is one of the safest and most permanent. The building, being absolutely fireproof, will be structurally sound for fifty or a hundred years.

The plan, if it is a real solution of the living problem, will result in an apartment always in demand. The changing tenants keep their apartments up to the very last thing in interior decoration and equipment. Thus the buildings are continually kept as good as new, and their earning power, instead of decreasing, will increase.

The operating expense can be reduced considerably during the four summer months because practically all the tenants are out of town and some of the employees can be dismissed. The endeavor should be to close the building as nearly as possible.

There is no definite way to establish the proper rent to charge for an apartment. It depends of course upon the law of supply and demand. Most apartments of this type rent for approximately 90 cents to \$1 per square foot of floor area. It is advisable, with this type of tenant, to establish the rates on a basis whereby the tenant pays for every kind of decoration. They all spend many thousands of dollars in this way, which otherwise would not be done. This goes to increase the value of the building and the renting value of each apartment.

It is because of such considerations as these that it is believed that the highest type of large apartment buildings constitute a peculiarly good investment. They should net an average return of 10 per cent or more, if properly built and operated.

Annual Meeting of the Illinois Society of Architects

THE annual meeting of the Illinois Society of Architects, held June 25, marked the close of a most useful and successful year in the history of this progressive organization.

In every field of architectural practice the Illinois society has been foremost in its endeavors to uphold the dignities of the profession and in the conservation of the interests of its members and the profession generally.

Through its initiative many radical changes have been brought about, all tending to the common good. Not the least of these is the movement inaugurated in this society and favorably considered by the Institute at its last convention, to take away from the practice of architecture certain archaic restrictions as to advertising.

Based on what this society has accomplished in the past, the future work will be regarded with considerable interest, and there will no doubt be equally valuable results.

A representative body is only representative in the truest sense when it vigorously and energetically covers the field in which it is placed. The various State societies are fulfilling these requirements in the highest degree.

As evidence of the very thorough way in which the Illinois society has covered its field, the following extract from the Secretary's annual report is of interest:

The society's year of activity which is brought to a close to-night finds us at the end of a period never before experienced in our annals. The country is in the very midst of a great war, the greatest, the most far-reaching in history. No class nor kind of human industry has been left free of its effects. Perhaps no class has been so greatly affected as have the architects. Not only have they been called into the active service of their country in the battle-front, but those who have been left behind have found themselves face to face with the great economic problem, which is the direct result of war conditions. Through this turbulent time the Illinois Society of Architects has maintained its organized activities. As hard pressed as many have been, yet they have stood staunchly by and allowed the great work which the society is doing to be carried forward, checked perhaps, but not stopped. And I feel that in this work the society is fulfilling its patriotic duty to "Keep the home fires burning." It is imperative that the results of efforts which have been put forth in years past should not be lost. The war is going to end sooner or later; we are going to be triumphant and then will follow the period of reconstruction, which I charge you, my fellow draftsmen, will mean a great upheaval in our profession. The Illinois Society of Architects should stand like a rock and we should bend our efforts to support her that when this period does come, the unity of the profession as exemplified by the society will carry us to the new standards unbroken.

In the year which has just passed the society has interested itself in many things. Besides the standing committees, the following special committees have been appointed: Committee to assist in floating the Liberty Loans, housing convention committee, committee for investigating the methods and practices of the Master Steamfitters' Association, committee to consider the resolution against the curtailment of public improvements, committee to consider the resolution addressed to the State Assembly on the subject of a comprehensive plan of organization for handling Government construction work, committee to consider the question of waiver of lien clause in the society standard contract documents, committee to recommend the names of men qualified to be superintendents in the shipyards, committee to represent the society in the Association of Technical Alliances.

Among some of the important work accomplished outside of committee work has been:

Full co-operation with the State Department of Registration.

Ladies' night.

Appointment of a Board of Examiners of Architects, all members of which are members of this society.

Among some of the most important activities of the board of directors have been the following:

Taking out membership for the society in the National Housing Association.

Subscription for the society to the Liberty Bond issues.

Appointment of a committee of twelve architects to work with the Association of Commerce.

Committee to assist in raising funds for the Y. M. C. A.

It is of interest to note that we have taken in sixteen new members and have had a net increase of nine. There are now 367 active members and eight honorary.

There have been four resignations, one reinstated, one dismissed for non-payment of dues and three deaths.

I am proud to report that thirty-one members of the society are in either the army or navy service of their country.

Address of President-Elect George W. Maher

I AM sure I appreciate the honor conferred upon me in being elected President of the Illinois Society of Architects.

The Illinois Society of Architects has a national reputation—it is favorably known as a public-spirited body of men interested in the proper development of the profession of architecture, especially in the direction of business co-operation with the various other organizations in the State of Illinois.

One of its important functions is to perform a public service, and the method to accomplish this result is the desire to co-operate with State municipal and all governing bodies. In addition to the above work, organizations such as the Illinois Society of Architects tend to bring men of a kindred purpose together and thus meet together on a common and friendly plane of service. It has been

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gratifying to note that a fine democratic spirit prevails, and I am sure it is due to this spirit that the Society has achieved so much toward the end it has aimed to accomplish.

It is well to remember that this organization represents the architects of a State that stands high in the life and activities of our nation. Illinois is the State of Lincoln and of Grant and of many illustrious sons who have left the glorious imprints of their vision, their deeds and accomplishments upon the traditions and spirit of our country.

There is in progress at the present time a great world war for the perpetuation of vital principles involving democracy, and which were so clearly interpreted by President Lincoln.

The Illinois Society of Architects I am sure espouses the same principles, and is determined by every means at its disposal to further these principles of democracy, both by constructive public service in our State and nation and also by any assistance we as a body of men can render our Government and country in this time of need.

I do not contemplate any radical changes in the work of the society, especially at this time, when many of our active members are absent in the patriotic service of their country. I shall endeavor to adhere closely to the line of my predecessors, being assured that the theory of procedure they have so ably established is bringing forth results of a most commendable nature.

I hope that the committees which I shall have the pleasure of appointing will carry on the work that has been inaugurated. I might suggest that they meet often and freely discuss the problems presented for solution. I am convinced that one of the reasons why constructive work is not always accomplished by committees is because they do not meet more frequently. If this should be the case, let each respective committee this year resolve to meet at least once a month or oftener as the case may demand—enthusiasm for the work can thus be sustained and results assured. We must not lose sight of the fact that such committee acquaintance creates comradeship and respect, and in my opinion our profession will advance in proportion to the encouragement of this principle and inclination to "get together" and thus promote mutual understanding and good fellowship.

The issue of advertising and signing of buildings brought before the last Convention of the American Institute of Architects was of great importance to the profession of architecture in this country. The canon, "It is Unprofessional to Advertise," as you are aware, was repealed.

The Board of Directors of the Institute have not yet defined in the "Circular of Advice" just what form this shall take. In any event this action of

the convention was a step in the direction of progress, and marks the purpose of the architects to keep in step and in tune with the forward tendency of the time.

As has been well said, there is a great difference between good and bad advertising; therefore the Illinois Society of Architects should, in my opinion, be guided by the wording and the intent of the forthcoming Circular of Advice.

The Illinois Society of Architects always aimed to co-operate with the Illinois Chapter of the A. I. A. This tendency should be encouraged to its fullest extent—we are one in the profession of architecture, each society working in its respective field toward the same goal. Our example will have much to do toward the cementing together in bonds of fraternity other activities of the profession in different parts of the country.

As a body of men trained to perform services of a technical nature, we wish to aid the public in all that will make our State a better place to live in.

We believe in better housing conditions in our factory and congested city districts. We strongly favor the encouragement of a more habitable and attractive type of farmhouse construction and country schoolhouse design.

We strongly advocate the enactment of a State-wide building code for the protection of the public. We recognize that now is an opportunity to broaden the principle underlying the Illinois law—licensing the architect.

The theory of the American Institute to make such an act uniform for all of the States is commendable. It is needless to say that any act proposed should be so drawn that it will stand the test of the highest courts of the State.

The Illinois Society *Bulletin* for June has a résumé of the discussion thus far entered into in respect to the proposed changes in the law. It is interesting to note that Illinois was the first State to enact any State legislation for the practice of architecture, and, therefore, as a result of this experience covering a period of 21 years should be able to formulate an act to embody that which is desirable in our present law, and yet be in harmony with new licensing or registration laws proposed for other States. This would maintain reciprocal relations, and be according to the principles recommended by the American Institute of Architects at the last convention.

We wish a proper interpretation and recognition of the term architect—so that the people will learn to differentiate between the function of an architect, an engineer and a general builder. Each have their respective work to perform in the community, therefore their vocations should not be confounded in the public mind.

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We are aware that we have a great task to perform in our rapidly growing State. The pioneer period has passed into the realm of history and the public have a right to insist upon a more beautiful municipal environment in their cities and towns. This fact should not be ignored by those in authority; the growing demand is for orderliness and beauty in public improvements which can only be obtained by the employment of trained assistance acquainted with this phase of development.

The close of the world war will mark a great epoch in the life and history of our country. What the future holds in store no one with certainty can anticipate. We do know that it will be a great reconstruction period, and preparations should be made for it in advance.

It therefore becomes the duty and opportunity of the architects to analyze the problems as they appear so as to arrive at a plan of action, also to visualize into the future, seeking to reach beyond the immediate present to forestall pitfalls and mistakes of policies relating to our organization and work in the State.

We may be assured that if our endeavors bring to pass in our State a more satisfactory building condition between all parties concerned, resulting in an improved understanding between the architect, the employer and the building trades, also a better and more intimate acquaintance with the members and leaders of the trade unions, that our efforts have not been in vain. Such action will assist materially in establishing a maximum of health, safety and happiness for the people.

Herein lies the great opportunity of our organization, and to the extent that we perform this service worthily we will grow in the confidence and esteem of the public and our fellow citizens.

Remarks by Stafford Fox Thomas, Retiring President

THIS evening marks another epoch in the history of the Illinois Society of Architects. Another milestone has been passed, and it is well to pause and take account of ourselves so that we may be able to exert our energies and improve our condition in those directions in which it is thought desirable, and conserve our energies where our efforts would be least effective.

In considering the record of the year last past there are some causes for gratification and some causes for regret.

When the outgoing officers were elected a year ago, war had been declared, but few realized what such a declaration involved or how it would affect the nation as a whole, our society or us as individu-

als. True, many of us recalled the Spanish American war, with our army of 200,000 men and a duration of less than five months, but if we compared the effect that that war had on business conditions with the effect that this war might have on business conditions we reflected that business was rather stimulated than otherwise by the placing of Government orders.

After fifteen months of war preparation, we now have a clearer vision of what the present war means to you and to me and to every living soul in the country. I doubt if anyone escapes being affected somewhat, and in many cases whole families have been disorganized and have had to reconstruct their ideas of living and conform to entirely new and different conditions.

Probably no class of business, if I may so term the practice of architecture, has been so adversely affected. Contractors and material men, it is true, have felt the strained conditions of the times, but in their case never before did such opportunities exist for making money, if only one was fortunate enough to secure the work which had of necessity to be executed.

With the architect a different problem presented itself. He found that his private practice had been swept away overnight as it were, and although there was a vast amount of work required to be executed in his line, such work did not go through his office or help to maintain the organization which he had been instrumental in building up. The Government said to the architect whom it chose to select for executing this work: I will take your time, your whole time and nothing but your time. His knowledge was commandeered, and it is true he was placed in a position of trust, but his organization had of necessity to fall by the way.

At the time of the declaration of war most architects were fairly busy, indeed, in point of numbers the majority were more prosperous than they had ever been before. Conditions brought about by circumstances following the declaration of war paralyzed the building industry, and building was brought to a standstill except for the few isolated instances where an owner had to proceed for the purpose of enlarging his business or other reasons best known to himself.

Little wonder is it that a spirit of despondence fell over the profession, yet notwithstanding all this, in all my contact with members of the profession I have yet to hear the first word of complaint on the part of the architects against their being out of luck; on the other hand, they have manifested a spirit of intense patriotism and indicated a willingness to cheerfully suffer even greater hardships if by so doing they could contribute one iota to the successful termination of the war.

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In this connection I would like to state that the architects have contributed liberally to the Y. M. C. A., Red Cross and Liberty Loan funds.

Our ranks have been depleted by those members who have joined the colors. This has seriously affected the work of the society. In some instances committees have lost nearly their entire membership. In our Honor Roll you will recognize the names of many familiar attendants at our meetings.

The Grand Architect of the Universe has called from their labors below Frederick William Worst, James J. Houda, Charles J. Furst.

Notwithstanding the condition of the times with which the society has had to contend, our membership is greater this year than last. We have not only held our own, but have increased our membership.

Our treasury balance is very satisfactory, and if we compare our resources with those of last year the balance is in our favor.

The master steamfitters were invited to attend one of our early meetings. We had a heart-to-heart talk with them, and I think the atmosphere was cleared from the viewpoint of both sides. The same thing might have been done with other organizations, but subsequent conditions did not warrant it. The restriction of work in the building lines necessarily afforded less opportunity for investigation.

I want to take this opportunity of publicly thanking Mr. F. E. Davidson, chairman of the Public Action Committee, for the excellent work done by his committee during the year. The meetings held out of town by the committee have resulted in a much closer bond among the architects in the State of Illinois, between those located outside of the city of Chicago and those located inside the city.

I also want to thank Mr. Wheelock, chairman of the Legislative Committee, for the work done by his committee. This committee has done some important work which will probably bear some fruit at the next meeting of the Legislature.

I cannot close without mentioning a word in regard to the *Bulletin*. I feel that especially in these times the *Bulletin* is a very important factor in carrying on the work of the society at home, and it keeps the members who are scattered for the time being in close touch with what is being done by the society. Again I have to thank Mr. Davidson for his untiring efforts as editor of the *Bulletin*.

Pittsburgh Urged to Plan Now

It is gratifying to note that at least one city, Pittsburgh, Pa., is planning now for operations of civic development to be carried forward after the war. It is a further source of satisfaction to record that this action on the part of Pittsburgh is due to the advice of an architect.

Ralph Adams Cram of Boston recently, and at the suggestion of the Art Commission of Pittsburgh, delivered an address during the discussion of the bridge construction and water-front improvements that are contemplated by the city of Pittsburgh. Commenting on Mr. Cram's address, the *Pittsburgh Gazette-Times* states in part: That utility and beauty are not incompatible, that the practical and the artistic are not necessarily antagonistic, is the sensible message which Ralph Adams Cram delivered to Pittsburgh in a discussion of bridge construction and water-front improvements on Wednesday night. No argument is necessary to convince anyone on this point, but considerable may be required to persuade public officers and people of the desirability of such unions and prevail upon them to pay for them.

The work will not be undertaken until after the war, but the very cogent observation was made that *now is the time to make plans*. And, as it is the people's business, sentiment should be molded while there is yet time in favor of developing a creditable, artistic scheme that will give pleasure to the eye as well as serve the material purposes of the community.

What Mr. Cram emphasized was that the whole community would be uplifted if the artistic were not forgotten or subordinated in public structures; that the instrumentalities of commerce and communication need be none the less utilitarian because they are made beautiful.

Actually it is simply a question of spending a little more money to make a bridge, for instance, a delight to the eye, instead of a structure designed simply to bear so much weight and stand so much strain. It takes no trained imagination to envisage the beauties that might be ours, as intimated by Mr. Cram, if we only would pay the price for developing what nature has given us.

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The Architect and the Code

IN other columns are presented two recently enacted building codes, regulating the construction and operation of motion picture film exchanges. The necessity for such requirements is clearly shown and the process of developing the fundamental data on which to base such ordinances is outlined.

The essential features of the ordinances are given in detail, and for two reasons. Architects will be commissioned to design film exchanges in cities where the regulations concerning them are either too lax in their requirements or do not exist at all. To meet this condition a careful study of the data given here will enable the architect to design such buildings in accord with the latest and best information obtainable. Where these conditions do exist, the conscientious architect will design better than the law requires and will be fortified in his position in opposing a client who possibly considers his dollars of more importance than the safety of his tenants and the security of his neighbors.

This information will also aid architects in their activities in connection with revising existing codes. That numerous codes must and will be revised is unquestioned, and there is a no more important undertaking for the architect than to be correctly active in the matter of building code construction. That such work is especially germane to the profession of architecture is not always appreciated by its

members. The influence of the codes is not always adequately appreciated and the wide variation in these regulations not definitely understood.

A Chicago architect recently designed a large factory building to be erected in Cleveland and the contract was awarded. When application was made for a building permit in the latter city it was found that the plans did not conform to the code of that city, but had been made as required by the Chicago code. This architect thought his local code was acceptable and sufficient for other cities. The necessary changes added several thousands of dollars to the original contract price and disclosed to the owner the fact that his architect had either been negligent or was decidedly provincial in his knowledge of the requirements of professional architectural practice. Such incidents occur frequently in all large cities and until a uniform code can be established it behooves the architect to be well informed on the ways of cities other than his own.

Labor After the War

THE problem of labor after the war will be one of the most difficult we shall have to consider.

Peace, when it comes, will work changes, in many ways as great as war has wrought.

The cessation of the many industries now engaged in supplying the needs of the Government will cause the shutting down of plants, and a vast number of men will, temporarily at least, be thrown out of work. To this number of unemployed there will certainly be added a further body seeking employment, composed of soldiers and sailors that have in the process of demobilization been returned to civil life. It has been stated that immigration from Europe after the war will be materially restricted. If it is not, to this large army of labor there must needs be added the emigrants who will flock to these shores.

James Rattray of the Guaranty Trust Co. of New York, in a recently delivered address, in which he discussed these features of the labor problem after the war in this country, directs attention to the fact that at the close of our Civil War we had available large tracts of undeveloped territory, and that the great migration to the West solved the problem of surplus labor.

Conditions to-day are very much different, and, as Mr. Rattray states, while our need for increased agricultural production is great, it is more likely to be obtained through the means of improved agricultural machinery than by large additions of farm labor.

These facts must be considered in solving the problems of labor. The depletion of reserve stocks

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of all commodities will necessitate production, and this production will absorb large numbers, but the period of readjustment, the arrangement of supply and demand, will all take time, and it will be during this readjustment period that we may look to a most unsettled condition as affecting labor.

The whole problem resolves itself into the shortening as far as possible of this period of readjustment, and it will require all the acumen of those at the head of our Government to bring this country safely through it.

Government Land for the Soldier and Sailor

COMMENTING on the fact that at the close of our Civil War many of the soldiers and sailors then returned to civilian life found new homes and new employment on the Government lands then available to the extent of an enormous acreage, the *Mississippi Valley Lumberman* directs attention that there yet remain 260 million acres of unappropriated land, of which not more than half is capable of cultivation. To this total of probably a hundred million acres of available land, it is further stated, may be added several million acres of "cut over" land, mainly in the South, the Lake States, and the Northwest.

It is gratifying to note that the Department of the Interior, through the official action of Secretary Lane, is fully awake to the necessity of immediately supplying the department with the fullest information as to land of every character that could be taken over by the Government, to supply to the men returning to civil life, acreages equal to their ability to secure it.

A very wise plan is being worked out, and one that in no way could be construed as offering charity to the soldier. The plan provides that the occupant of these Government lands shall by such occupancy be considered as remaining in the service of the Government, and that his efforts will constitute a part of the development of our resources. By the successful carrying out of this plan many men whose inclinations lie in the direction of farming will find a most excellent chance to take up their

work along congenial lines, and feel the great satisfaction that comes of the knowledge that the nation is fully alive to the large debt it owes them.

This plan of successfully relocating men whose patriotic response to the call to the colors has interrupted their formerly steady occupation, will, if practically carried forward, be an important part in the efforts to solve the difficult economic problems that will surround labor when this war has ceased.

The Oregon Chapter Doing Its Bit

THE Portland, Ore., Chapter of the American Institute of Architects, in passing the set of resolutions, to be found elsewhere in this issue, freely offering their professional advice on housing matters, is performing a patriotic and commendable act. The services of such a group of men, trained in the best artistic practice of their profession, with which is combined a practical knowledge of every branch of building construction, is of incalculable value.

By this generous act the people of the State of Oregon are enabled to avail themselves of a trained technical service such as will help them to meet and successfully solve all the many and complex features attending the housing problem.

It is not so much the present that will be well served by this offer of co-operation as the future. Every critical observer has become painfully aware that, in many localities, the haste to meet a present need is serving to create conditions that in future will stand as a reproach and as an object lesson of unfortunate blunders in housing matters, resulting from haste and the absence of skilled planning. Bad architecture and poor selection of materials are, in many plans, so evident that it is easy to comprehend that the buildings will not continue successfully to serve the purpose of their erection.

If the people of Oregon accept now the services of their architects in the same free spirit they have been offered they may rest secure in the knowledge that they will not have to suffer later any regrets due to ignorance similar to those already experienced by many dwellers in other localities.

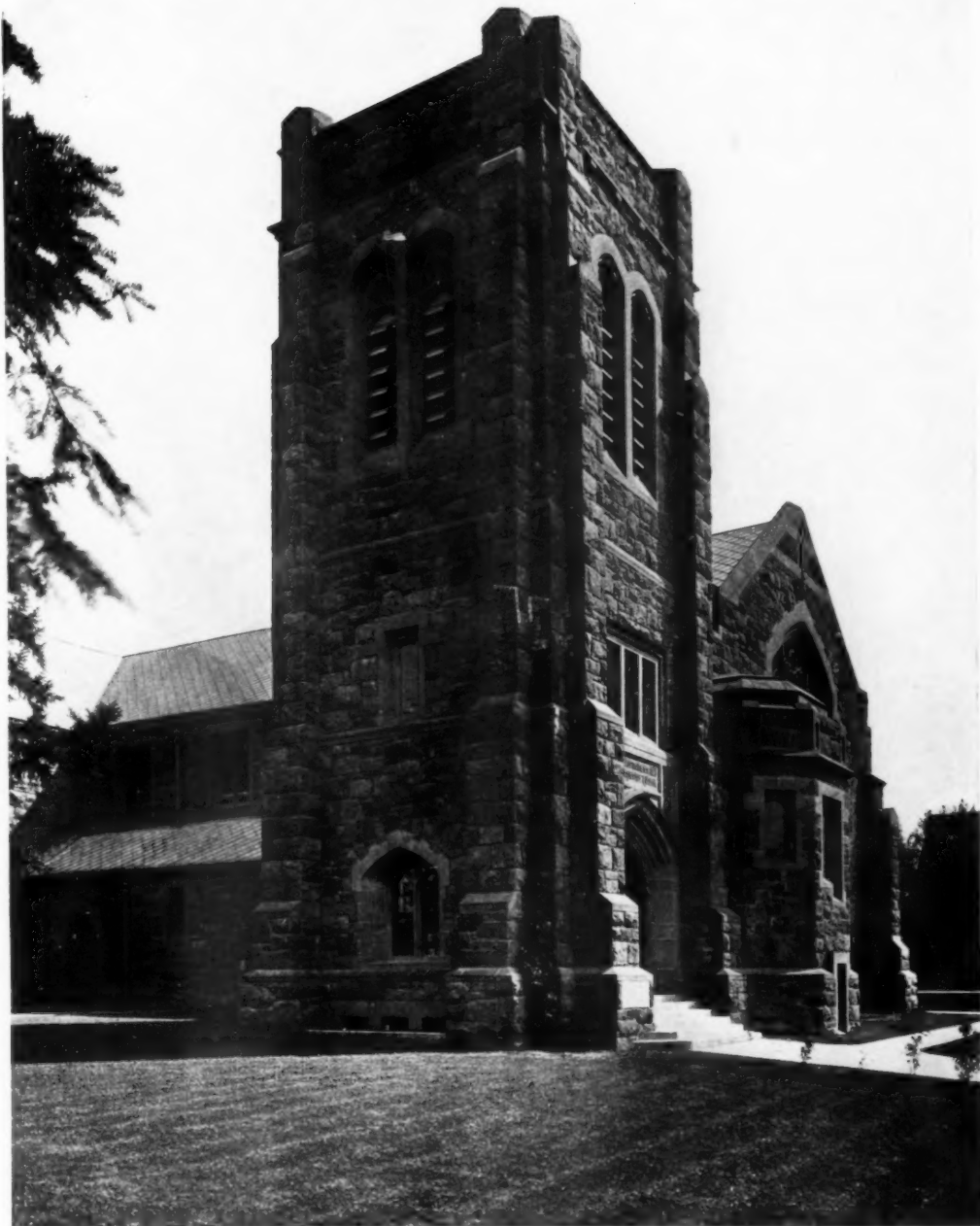
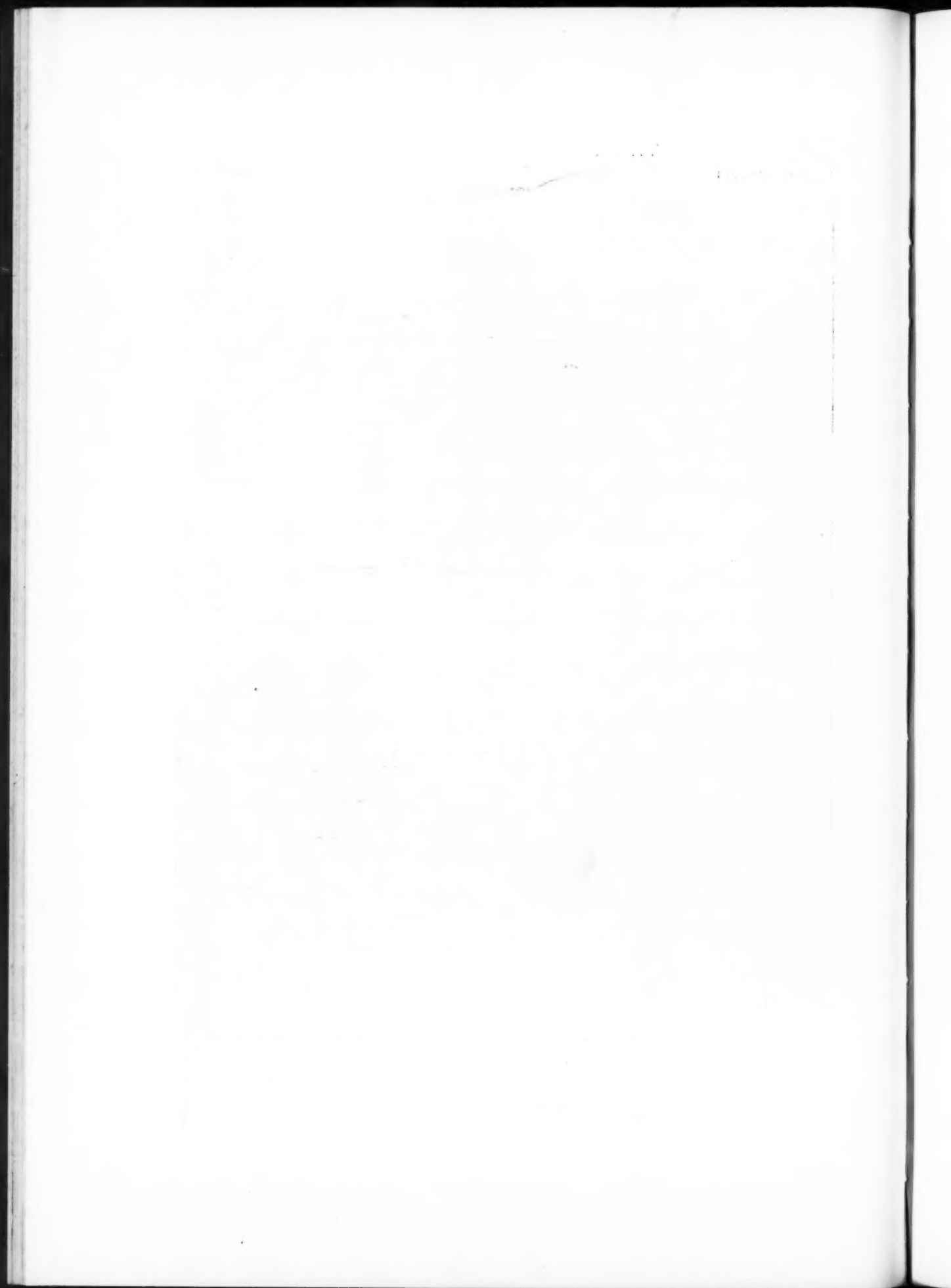


PLATE 17

WESTMINSTER PRESBYTERIAN CHURCH, PORTLAND, ORE.

LAWRENCE & HOLFORD, ARCHITECTS



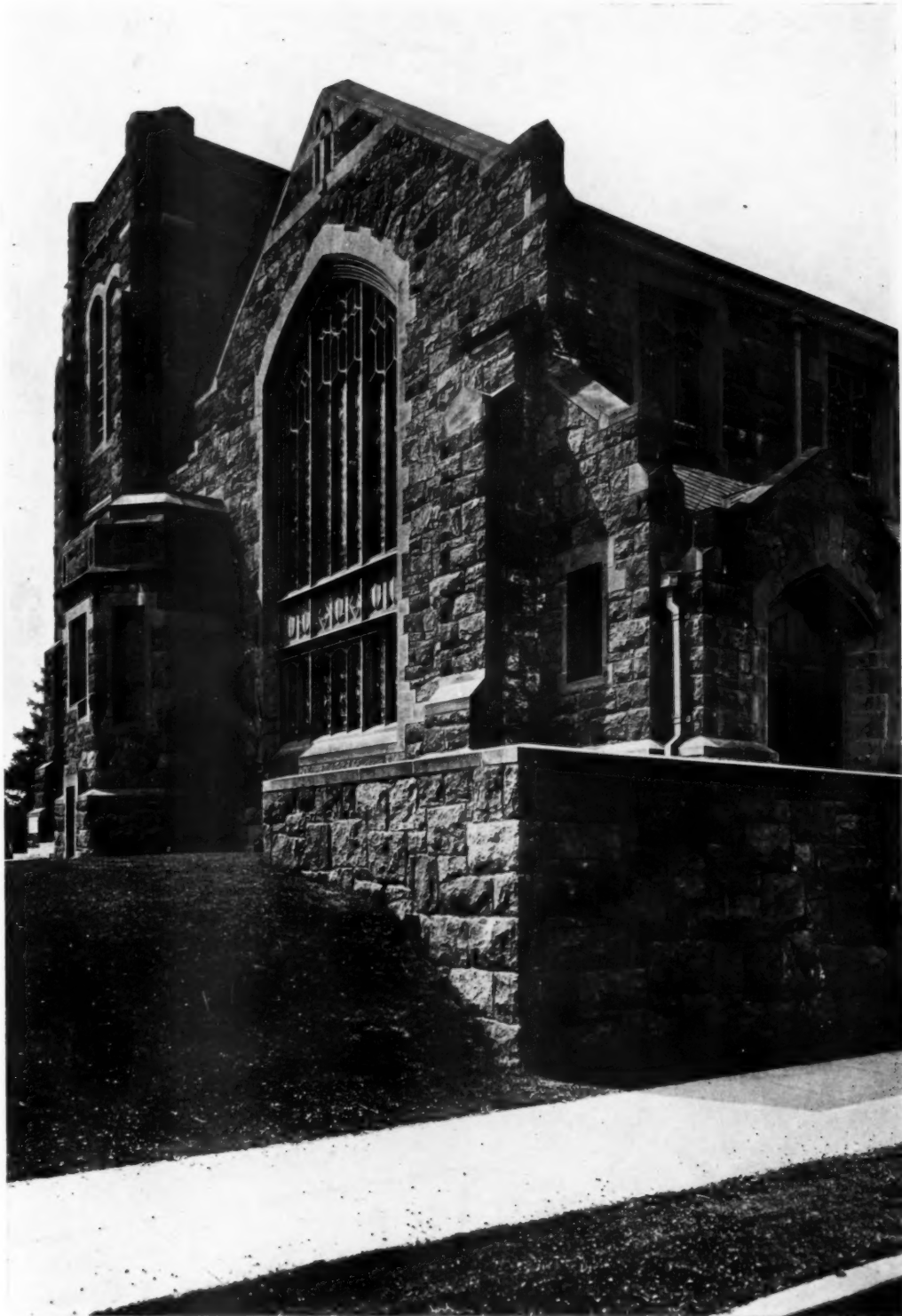


PLATE 18

WESTMINSTER PRESBYTERIAN CHURCH, PORTLAND, ORE.

LAWRENCE & HOLFORD, ARCHITECTS

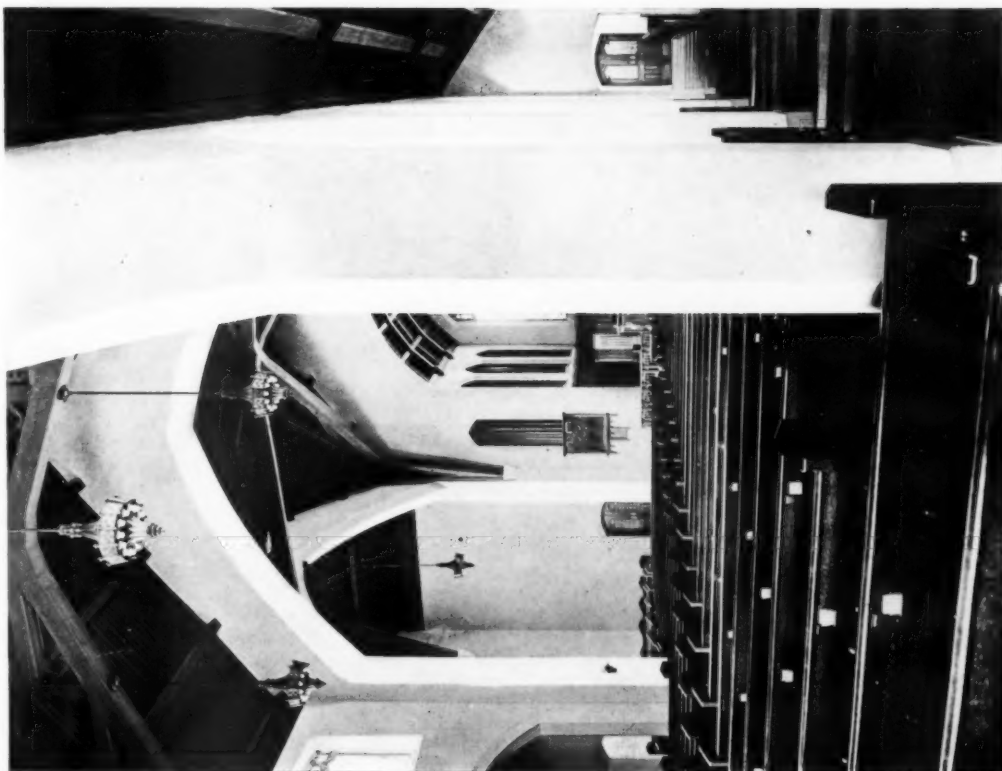
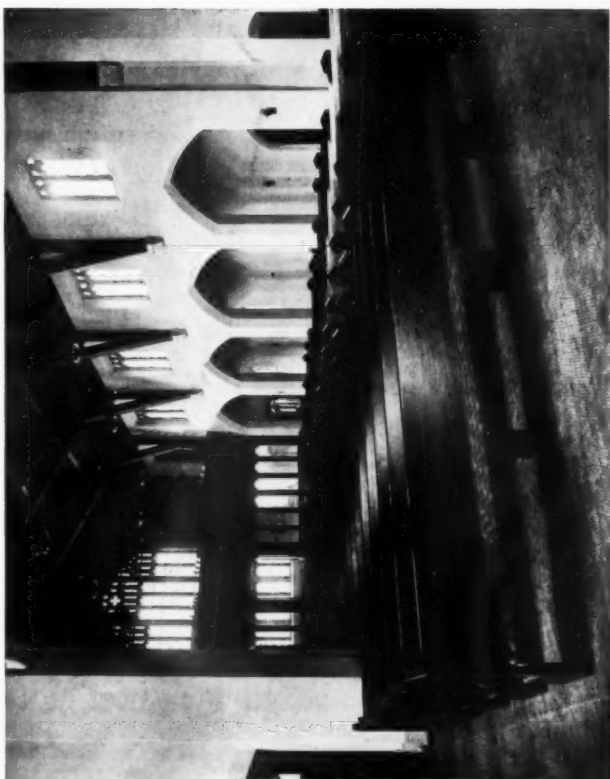
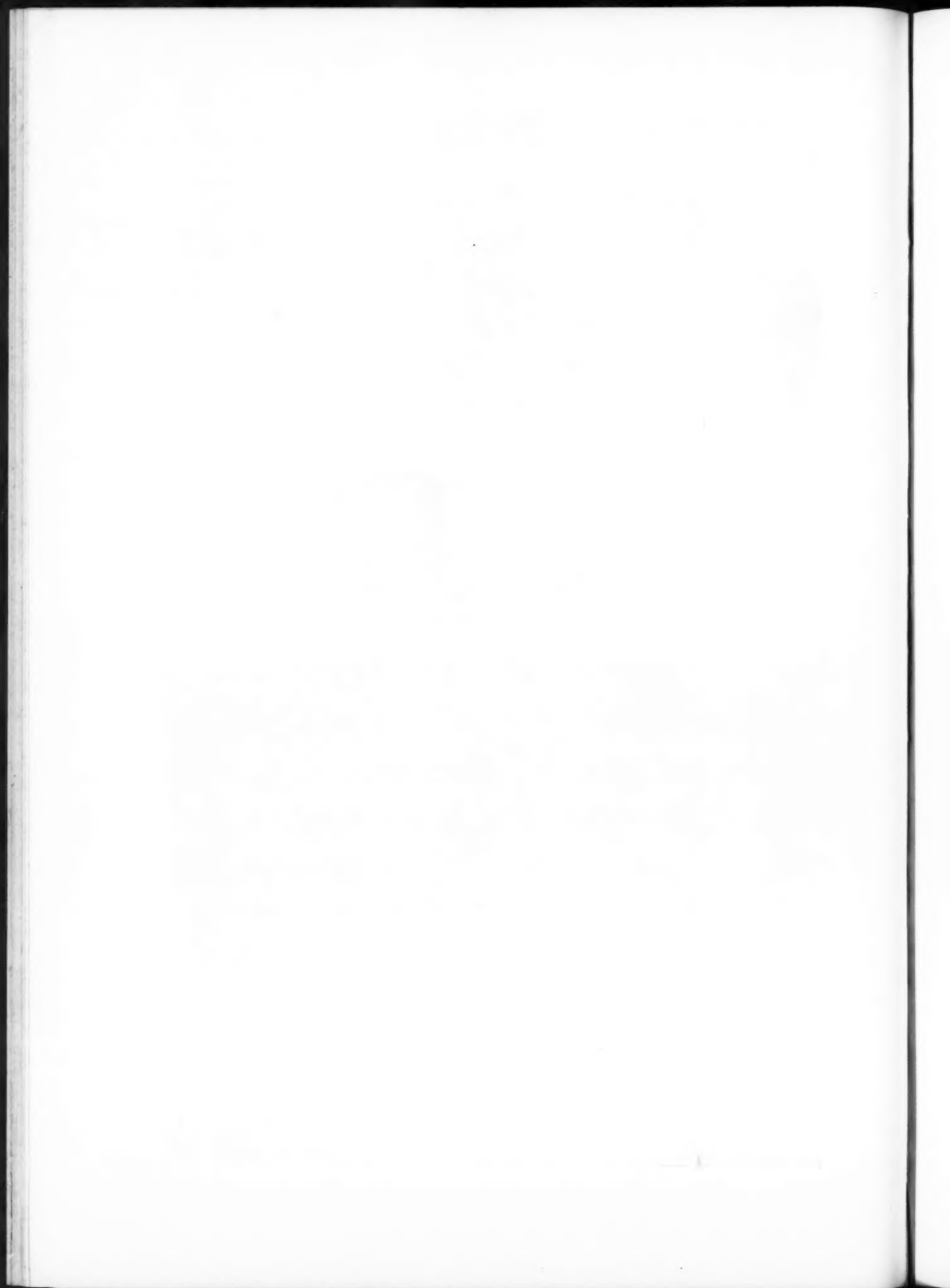


PLATE 19



WESTMINSTER PRESBYTERIAN CHURCH,
PORTLAND, ORE.

LAWRENCE & HOLFORD, ARCHITECTS



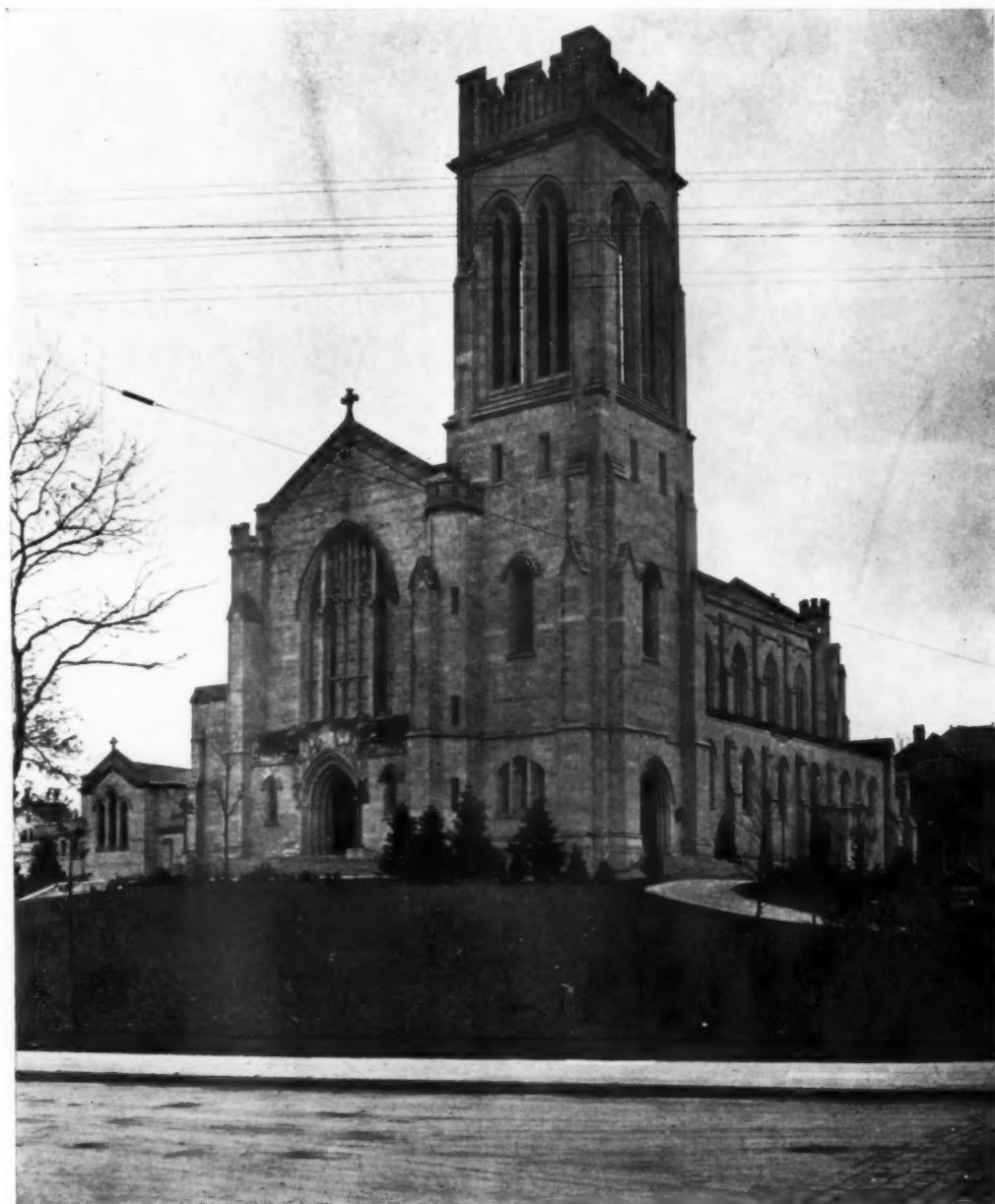


PLATE 20

ST. MARK'S CHURCH, MINNEAPOLIS, MINN.

HEWITT & BROWN, ARCHITECTS

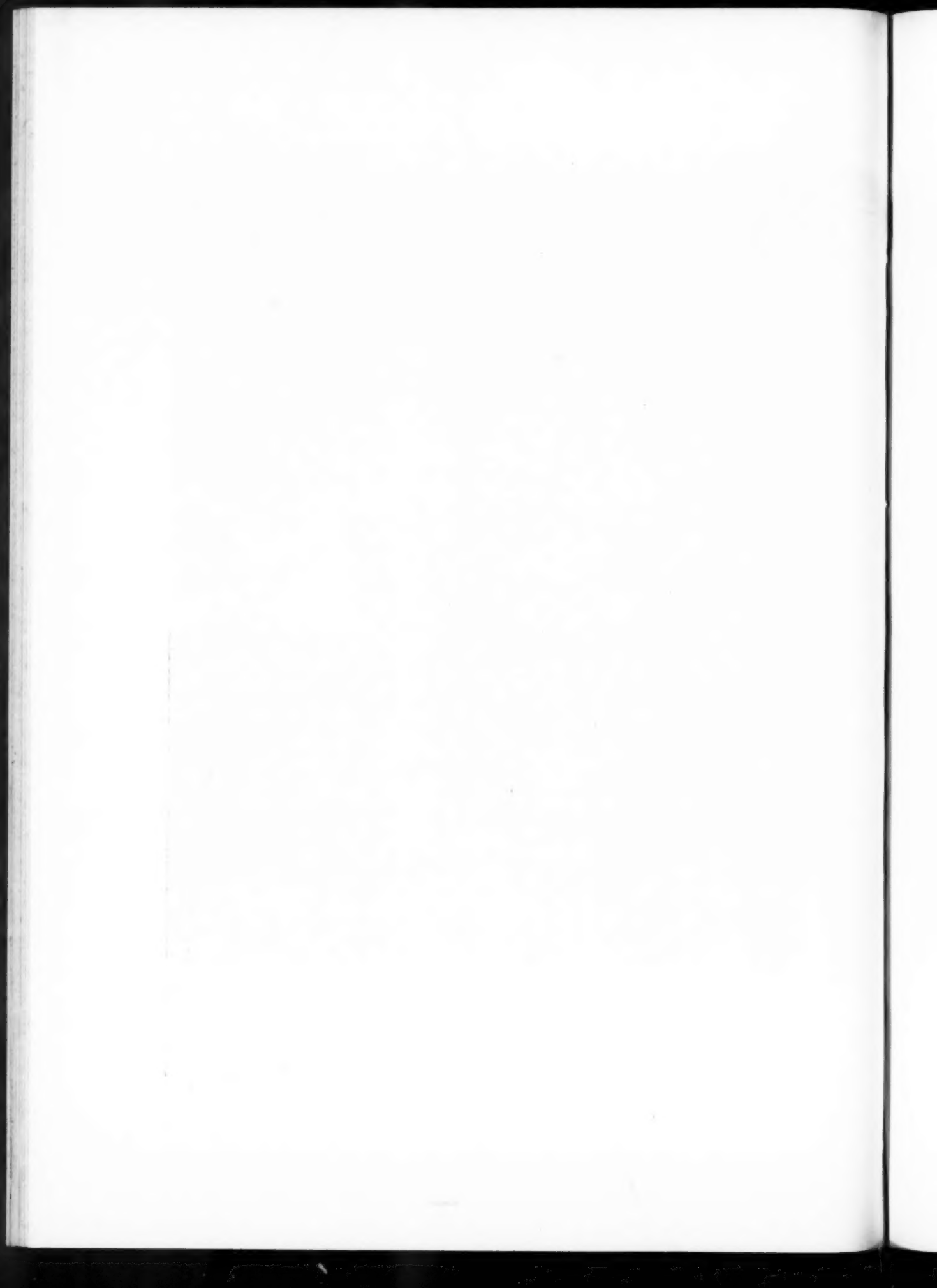




PLATE 21

ST. MARK'S CHURCH, MINNEAPOLIS, MINN.

HEWITT & BROWN, ARCHITECTS



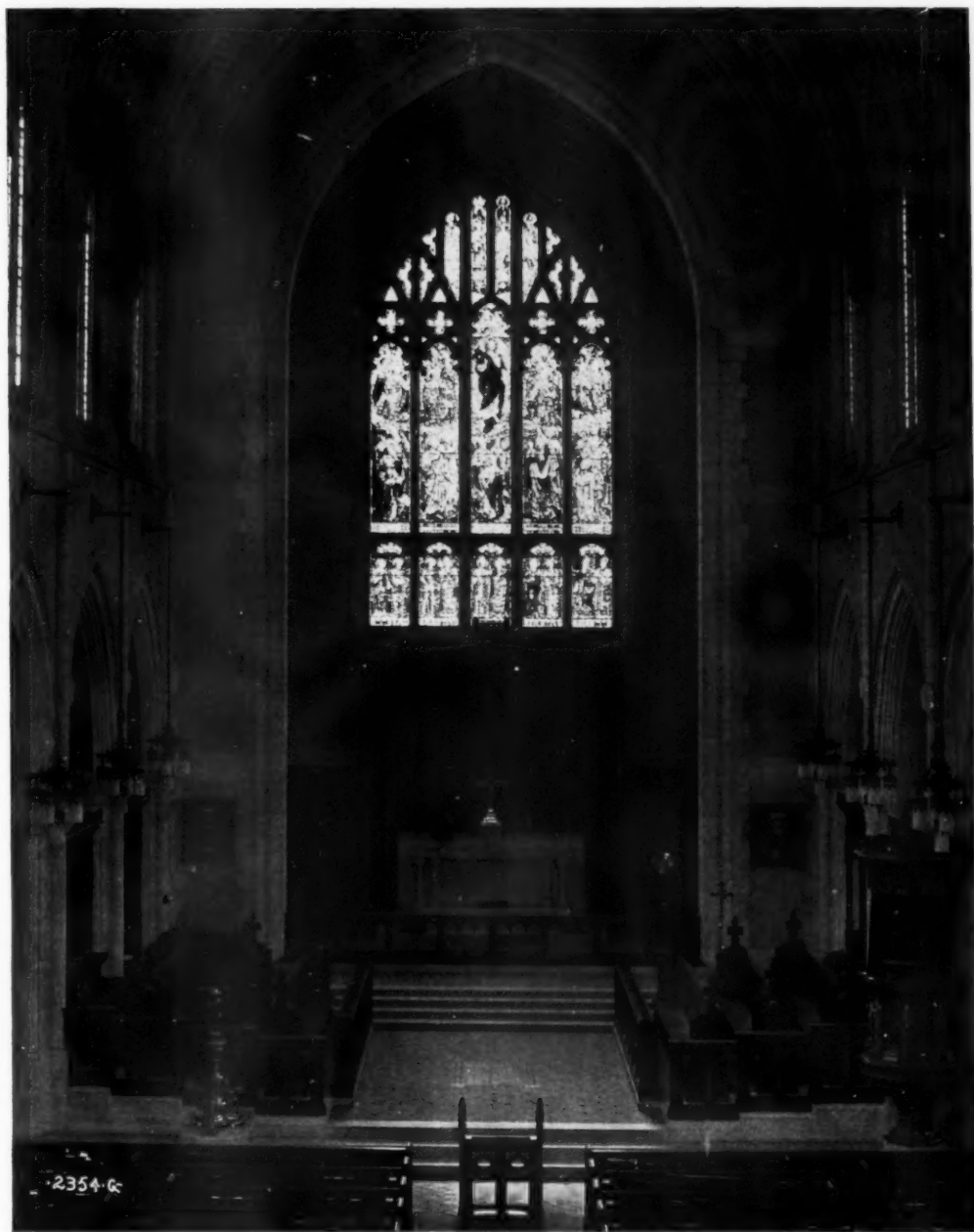


PLATE 22

ST. MARK'S CHURCH, MINNEAPOLIS, MINN.

HEWITT & BROWN, ARCHITECTS



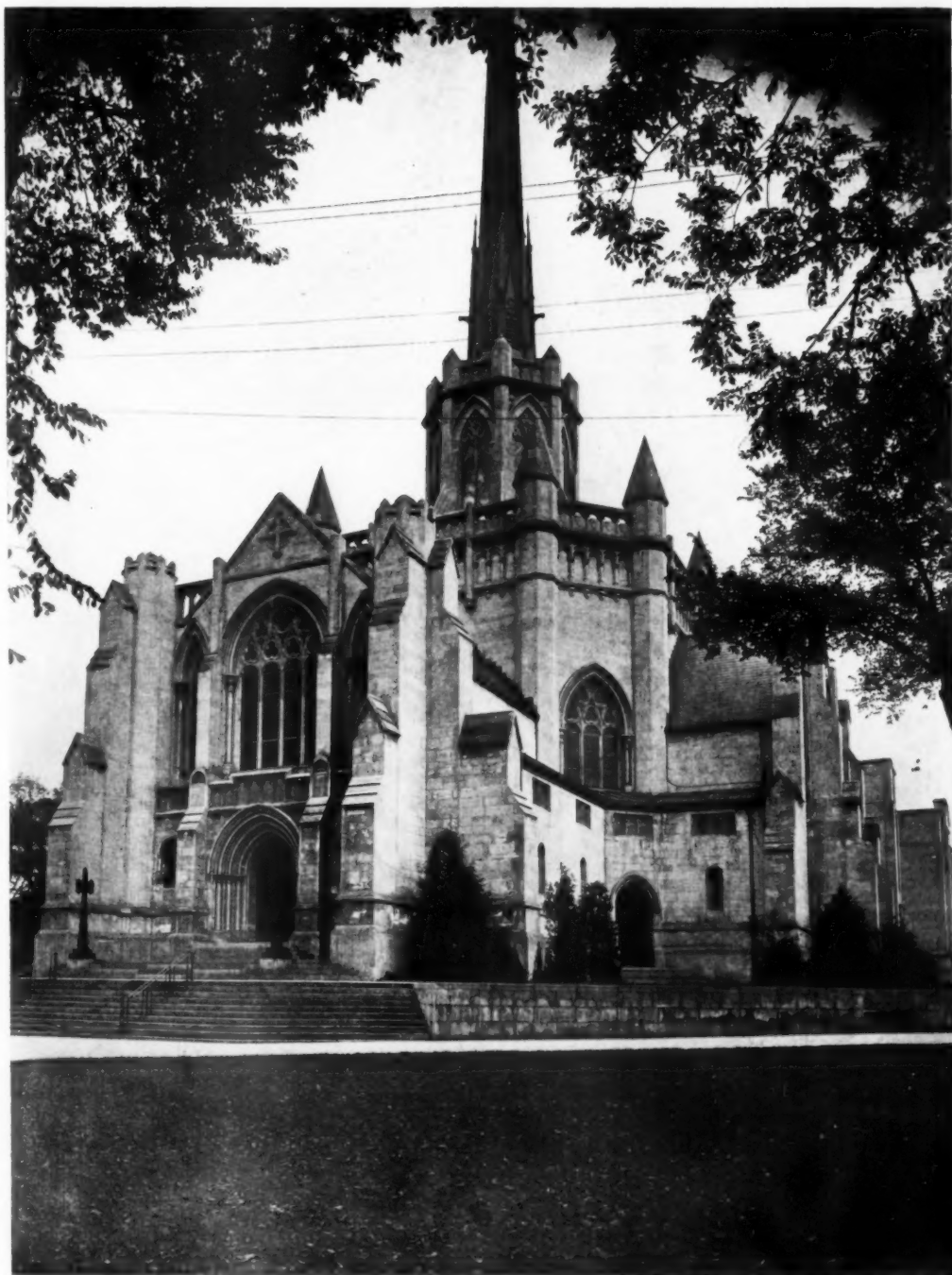


PLATE 23

HENNEPIN AVENUE CHURCH, MINNEAPOLIS, MINN.

HEWITT & BROWN, ARCHITECTS

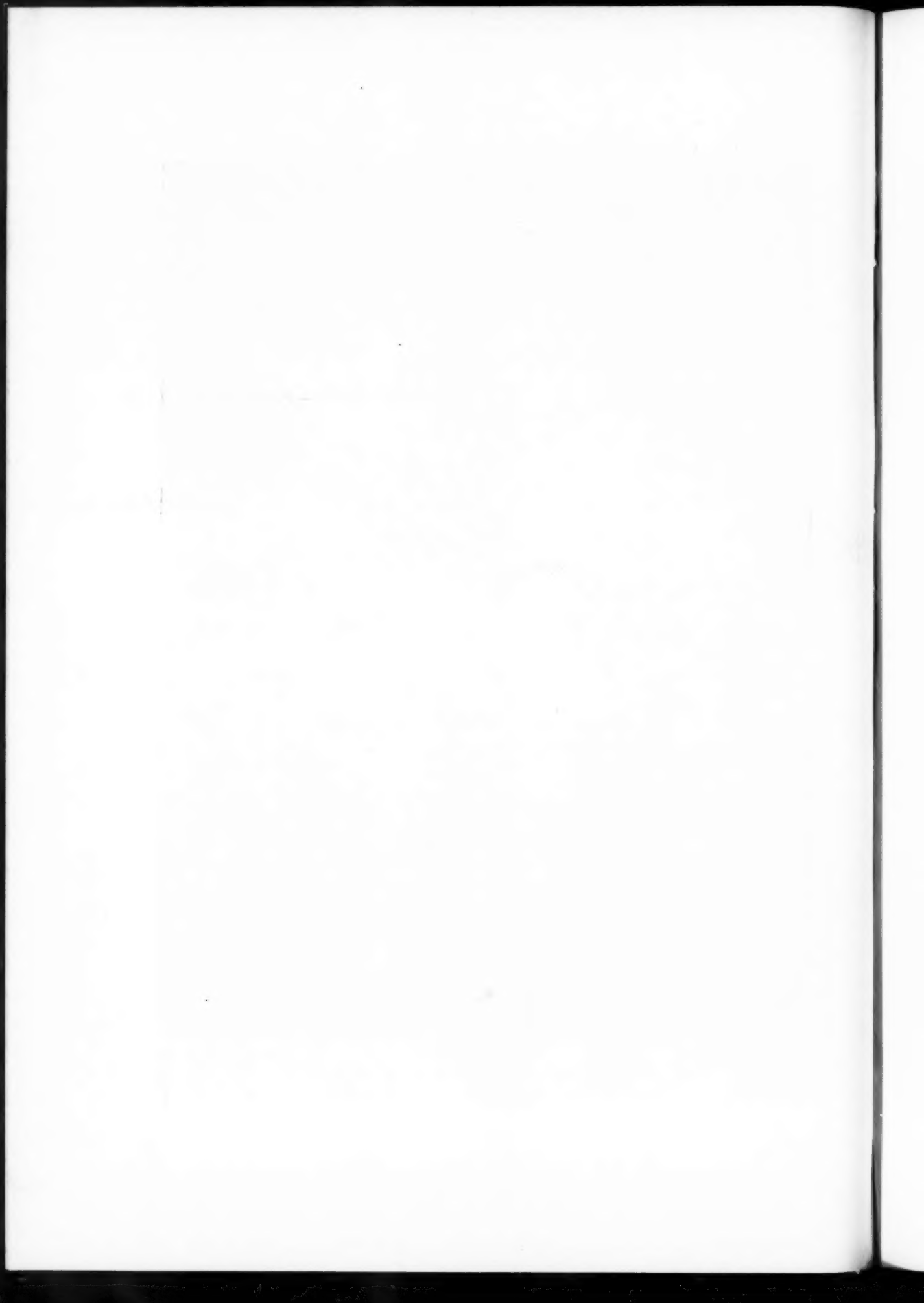




PLATE 24

HENNEPIN AVENUE CHURCH, MINNEAPOLIS, MINN.

HEWITT & BROWN, ARCHITECTS

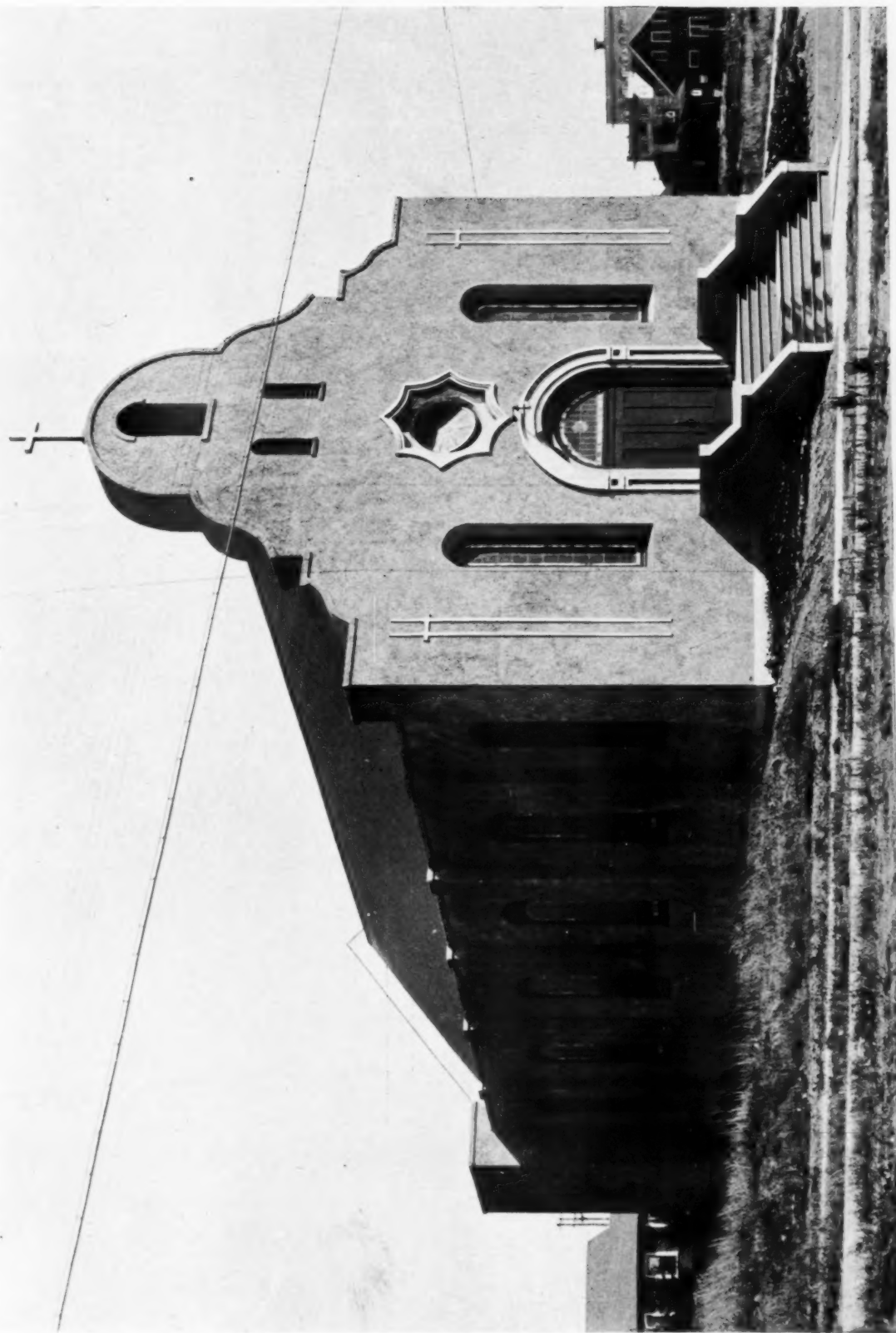


PLATE 25

ST. JOHN'S R. C. CHURCH, SAN DIEGO, CAL.

JOHN S. SIEBERT, ARCHITECT

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THE AMERICAN ARCHITECT

Resolutions Passed by Oregon Chapter, A. I. A.

OFFERS FREE SERVICES IN HOUSING MATTERS TO ALL COMMUNITIES IN THE STATE OF OREGON

Whereas, The solution of the housing problem, as applied to the war workers, has been recognized, by all the warring nations, as a vital part of their war program; and,

Whereas, The United States, appreciating the need of efficient and contented workmen to speed up production of war supplies and ships has appropriated \$110,000,000 for the purpose of building quarters for war workers; and,

Whereas, Statistics prove that Portland is confronted with a serious shortage of desirable quarters for workers in the shipyards and other war activities, thereby jeopardizing the fulfillment of her duties to the Nation in this crisis; and,

Whereas, The Oregon Chapter of the American Institute of Architects is, from the experiences of its members, keenly aware of the difficulties existing to solve this serious matter, in the way of increased building costs, in securing skilled labor and materials; and,

Whereas, The Oregon Chapter of the American Institute of Architects is desirous of doing all in its power to aid the Government at this critical time, therefore be it

Resolved, That the Oregon Chapter of the American Institute of Architects hereby offers its services in an advisory capacity, without cost, during the war, to all Portland organizations interested in the housing problem; and be it further

Resolved, That the Housing Committee of the Oregon Chapter of the American Institute of Architects be hereby instructed to gather and present all information at its disposal, to the public and to any Portland organization asking for professional advice on housing matters. Should actual maps, layouts, and plans, be needed at the minimum cost for the success of any approved housing venture, then the above committee is hereby instructed to report back to the Chapter, which will attempt to secure such maps, layouts, and plans, at net cost of production; and be it further

Resolved, That this offer holds good to all other communities in the State of Oregon and to environs of Portland.

For the Oregon Chapter of the American Institute of Architects. By

JOS. JACOBBERGER, President.
ALFRED H. SMITH, Secretary.

The Conscription of Wealth

The Hardwood Record is of opinion that "talk without much thought back of it is being heard about the conscription of wealth for carrying on the war." Continuing, it states: "The idea that seems to be held by most people who do this talking is that property should be drafted into service and used by the Government; that instead of selling bonds from time to time, and collecting taxes for war expenses, it should take property and use it.

"The Government can take men and it can take property to the last man and the last dollar, and it can be done according to law; but some things are lawful which are not expedient, and the seizing of property is, in most cases, inexpedient, and therefore should not be done. Most of the talk has been on the subject of seizing sawmills and timberlands; but something is heard also of the conscription of agricultural lands, manufacturing plants, mines, railroads, and other property.

"The Government is already getting the use of all the wealth in the country, and what more could it get by taking possession of the property? The production is all it can use. The output of the mine, of the sawmill, and of the factory is all that counts. The farm cannot assist the Government, except by furnishing grain, hay and other foods and provender, and it is already doing that. Sawmills can do no more than furnish lumber, and they are already doing that. If the Government should take possession of farms, it would be obliged to till them, and it cannot do it so effectually and so economically as the owners of the farms can do it, consequently, to conscript agricultural land would certainly result in smaller production. In almost every instance the owner is the best manager of property. He is skilled in its use, and he knows how to bring best results. Only in cases where owners of property are not making it produce as much as it ought, would the Government be justified in seizing the property and assuming its management. If the owner of a mine should refuse to dig coal, or would not sell it at a reasonable price, the Government could and ought to take possession and increase production; for it cannot be too often or too strongly emphasized that in carrying on the war, it is production and not the property itself that counts.

"Liberty loans are paid from the earnings of property in private hands. Property in Government hands pays for no bonds. Experience has shown that the private business man is the most efficient business man; and it would seem to be the part of wisdom to leave private property in private hands, and thus assure the largest and most economic production for the use of the Government."

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War Department Its Own Office Building Contractor

The following statement is authorized by the War Department:

Three temporary office buildings, providing working space for 6250 persons, have been erected in Washington by the Construction Division of the Army, without the employment of a contractor, in 10 weeks.

One of the buildings, a three-story structure, 491 ft. long, 260 ft. wide, with a floor space of 270,000 sq. ft., was ready for occupancy twenty-four working days after the first spadeful of earth was turned.

The principal reason for the Construction Division undertaking this work by direct labor was to provide itself with a "measuring stick" for gauging the work of private contractors on the other big jobs they are now doing for the Army under supervision of the Construction Division on the "cost-plus" form of contract. The result has justified the "cost-plus" contract and proved that the Government is and has been getting what it has paid for in the construction work, both as regards quantity and quality.

Heretofore all emergency war-use buildings have been erected by contractors. When the Construction Division was requested to provide these three buildings, the permission of the Secretary of War was secured to erect the buildings without the aid of contractors. All skilled and unskilled workers were employed through the Civil Service Commission and the work was supervised and directed by officers of the Construction Division.

These buildings, which cover a total area of approximately 850,000 sq. ft., have been constructed considerably within the appropriation of \$2,377,500. The work has involved the use of about 5,000,000 ft. of lumber, 3600 squares of roofing; 25,500 barrels of cement, and 80,000 yards of plaster. The average number of men employed was 2671 per day and the maximum 3500 per day. In the cost of the buildings is included a steam line for heating, with exhaust steam from a power plant to the building site.

A Boost for Americanization

A pocket reminder on War Americanization Service, entitled "What You Can Do for Americanization," is being widely distributed among industries, says a bulletin of the Chamber of Commerce of the United States. The suggestions for the business man are as follows:

Conserve men. Go further than eliminating waste and see that the safety, sanitation and hous-

ing of your men is keeping them fit during the war.

Every man or woman who does not speak English should be learning it. Insist upon their learning it in school or in your shop and designate one of your employees to see that it gets done.

Urge the public educational authorities to start language classes in the factory for those who do not understand English and are unable to attend school. Efficiency increases with knowledge of English and citizenship. Give it recognition by increased wages and promotion.

Stop anti-American propaganda and agitation the instant it raises its head in your plant by providing information and co-operation on true Americanism.

Invite naturalization officers to explain citizenship to your aliens and encourage them to make America their home. Give them time off with pay to attend to their naturalization examinations.

Develop incentive through wages, hours, bonuses, insurance pensions, safety, profit sharing and co-operative management. The employer who keeps his men at work contentedly to-day is America's most practical patriot.

Great Hospital Is Ready

FOX HILLS INSTITUTION CAN CARE FOR 1800 SOLDIERS

The Y. M. C. A. hut at the United States Base Hospital at Fox Hills, Staten Island, was completed June 29. In all eighty-six buildings were constructed in 100 days. The hospital will now accommodate 1800 patients with a staff of 650 physicians, nurses and attendants under Colonel William Rutherford of the United States Army Medical Corps.

The hospital is one of the largest in the world. The main buildings are all made of wood and are one-story in height, 350 ft. long by 30 ft. wide. There are three large wards in the large buildings which contain 1000 beds each and are connected with each other so that patients can be transferred without going into the open air. The transports will land their patients at the Quarantine Station and they will be taken to Fox Hills in automobile ambulances.

The American Red Cross completed a theater for the patients recently which will seat 7200 persons. It is planned to have entertainments there for the wounded soldiers afternoons and evenings.

The hospital was constructed under the supervision of Major Edward A. Simmons of the Quartermaster's Department. Fifteen acres of land adjoining the present site have been purchased by the Government, so that the capacity of the hospital can be doubled at any time.

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Check Shipyard Building

SHIPPING BOARD TO ASK CONGRESS FOR RESTRICTING POWER

A law under which the Shipping Board could prohibit the building of new shipyards in the United States or the extension of existing shipyards is to be asked of Congress, according to an announcement made by Chairman Hurley. It was explained that the intent is to prohibit the building or the extension of a shipyard without first a permit being granted by the Board. This restriction is intended to give the Shipping Board power to conserve both labor and shipbuilding supplies and to prevent any reckless speculation in the means of producing new tonnage.

It was learned that a request for such legislation has been made by the Shipping Board. Chairman Alexander, of the House Merchant Marine Committee, has been asked to include this proposition in an amendment to the shipping bills which are now pending before the House.

Public Opinion and War Housing

"Our Government does not want to spend the people's money in a way the people do not wish it spent. Unless we insist upon this housing problem being handled in the same manner that Germany handled it before the war and England and France have handled it since the war began, we are going to be left behind in the present struggle and in that other great commercial and economic war that is coming later," said Charles Collens, architect and secretary of the Boston Society of Architects, recently in an interview in the *Boston Transcript*.

"In the present crisis the Government is beginning to find that high wages alone will not hold labor at the huge new plants which in many cases are growing up in localities either far-removed from housing districts or in which the present housing facilities are being exploited or are too meager. Where a man has to do the same thing over and over every day he becomes dull and apathetic. Where he can only find housing in localities in which tenements, one just like the other extend in unbroken lines, his apathy is only increased. Monotony of labor can only be counteracted by variety outside of the factory. A man will come to his work every day with a new zeal and his output will be correspondingly increased if he lives in an environment of neat clean houses, architecturally placed and architecturally treated, houses with gardens, if possible, and on streets with green trees, occasional park spaces, and with such amusement

places, clubs, churches and stores as are essential to any self-respecting community. This is not a philanthropic movement, but a matter of dollars and cents to the great manufacturers. Moreover, it may become a matter of life and death to this country unless public opinion is roused to a realization of the importance of this housing problem."

Housing Plans in Washington

Not so very long ago Washington, D. C., was filled with alarm lest the large increase in population would develop a shortage of houses and boarding places for the army of people who were being brought to that city to speed up the Government's war preparations.

So efficiently have those in charge of these matters set about to provide for every possible demand, that at the present time, it is now stated, there are two thousand more rooms available than there are persons to occupy them. These conditions will not last long, as there is expected to be an influx of 20,000, at least, more clerks, and these will have to be provided for. As a proposed scheme of solution there are what are called Government dormitories, and steps are being taken to erect this type of building in sufficient numbers to meet the demand.

Erie Had Housing Problem 105 Years Ago

One hundred and five years ago Erie, Pa., had a housing problem just as it has to-day, only not of such large proportions, due to the fact that labor was rushed to Erie in 1813 to aid in the constructing of Perry's great fleet.

Proof of this fact was produced by Carl Reed, who unearthed an agreement made March 13, 1813, between Rufus S. Reed and the town of Erie, and Noah Brown, the master shipbuilder of New York City, who went to the city to build six boats for Perry's fleet.

Standards for Industrial Housing

The Department of Labor, Bureau of Industrial Housing and Transportation, has issued a pamphlet setting forth the standards recommended for permanent industrial housing developments.

These standards are not intended as inflexible requirements, but it is announced that any plans which fail to conform to them are not likely to be accepted unless supported by very strong reasons.

Copies of this pamphlet will be supplied by the Department of Labor on application.

Conferences on Re-education Called by Vocational Board

The Federal Board for Vocational Education authorizes the following:

Congress, without dissenting vote, having charged the Federal Board for Vocational Education with the work of re-educating for civil employment the disabled men of the United States land and naval forces, a conference of the various State boards has been called by Dr. C. A. Prosser, director of the Federal Board, to assemble July 11. The meetings will be held in Room 226 in the Senate Office Building, Washington.

The administration of the Smith-Sears Act under which the work of re-education is authorized will be discussed; also the war emergency education which has been in progress under the direction of the Federal Board since last fall, by which radio and buzzer operators, oxyacetylene gas and electric welders, gas engine mechanics and operators, electricians, telegraph and telephone repairmen, aviation mechanics and special workers, gas engine and motorcycle repairmen, chauffeurs, shipbuilders and other occupations have been trained for the use of the armed forces of the Government.

As the training of the disabled soldiers and sailors will be carried out mainly within the various States, it is necessary to map out a definite program which will not interfere with the work already being done under the Smith-Hughes Act for vocational education or conflict in any way with the work of the State boards for vocational education through which the Federal Board operates.

Industrial Housing in England

In England, as in this country, there is wide divergence of opinion as to just exactly the type of house and plan that will best meet the conditions of labor after the war.

The Architects' and Builders' Journal of London devotes considerable space in recent issues to the topic of industrial housing, and the standardization—if it may be so called—of a universal type of house.

In a recent article in that journal the following appears:

Then there are the people who do not worry about plans but go straight for detail—talk learnedly of the position of the scullery copper, and remind you how that useful domestic engine generates steam in the home on washing days, and implore you to banish the copper. There is the parlor school, who want to elevate the workingman by giving him a

sanctum for the family gods, and their sternly utilitarian rivals who say, "No," that parlors are never used, and being dedicated to stuffy solitude, spell waste, and so weaken the moral fiber of the workingman. There is the political school, which holds out hopes of cottages to men who vote blue, black or purple. "Small Owners," "Small Holdings," "Three Acres and a Cow," "The Big Loaf," "Back to the Land," are more reminiscent of electioneering than work accomplished. In the skillful hands of the politicians promises are freely made and used as narcotics, or a camouflage of their own evil intentions.

And now that the work must be done, and 300,000 cottages built, what are the proposals? The latest idea is the standard plan. All those in authority feel that somewhere or other there must be hidden a stock pattern plan of the ideal cottage, which, once discovered, can be used as a sort of stencil plate, and copies rubbed off and supplied gratis to all the authorities who want to build.

War Housing Activities to Be Under Direction of Secretary of Labor

The President has signed an executive order directing that the Secretary of Labor shall have all power and authority in providing housing for war needs.

In conformity with this order the Department of Labor announces that work will be begun at once on the various projects which have heretofore been under consideration by the Bureau of Industrial Housing and Transportation.

This work will be under the direction of Otto M. Eidlitz, who will be in charge of the administration of the appropriation of \$60,000,000.

British Plans to Rebuild Trade

The Imperial War Conference in London is devoting its attention almost exclusively to various phases of the post-war economic policy of the empire. Resolutions have been adopted dealing with the British Nonferrous Metal Industry act which aims to free the empire from dependence upon German-controlled organizations; with measures necessary to obtain for the empire and its allies the command of certain essential raw material to enable them to repair the effects of the war as soon as possible and to safeguard their industrial requirements, and with the appointment of a committee to consider possible methods by which these essential raw materials might be obtained.

The conference expressed the opinion that the

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governments of the British Empire should make such arrangements among themselves as would insure that essential raw materials produced within the empire should be available for utilization within the empire and within allied countries.

Germany's inability to procure raw materials has led to the closing down of a great number of her industries. Returns published in the German press show that only 70 out of 1700 spinning and weaving mills are now able to keep open; that only 2500 out of 45,000 silk looms are in operation; that only 15 out of 720 plants in the oil industry can do business, and that one-half of the boot and shoe factories of the empire are closed.

Before the war Germany imported £250,000,000 worth of raw materials to keep her trade going.

Salvage of Waste Material Made Profitable in England

The National Salvage Council in England is now urging all local authorities to recover for utilization waste and dormant materials hitherto regarded as "refuse." A definite national use has been found for many of these articles, and by well-organized collections and proper treatment not only have national resources been conserved but a reduction has been effected in the tonnage required for the importation of new raw material.

Lincoln Highway "Markers"

It has been decided to commemorate the improvement of the desert section of the Lincoln Highway in Utah, the improvement of which has been brought about by the Lincoln Highway Association, by the erection of artistic markers at the points upon the trans-continental route to the west of Salt Lake City, known respectively as the Fisher and Goodyear sections of the Lincoln Highway. The road improvements in question will forever eliminate the worse section of the Lincoln Highway between the two coasts, and bring about a material shortening of this desert section of the route.

To be in keeping with this epochal development in American road building, the advice of architects has been solicited concerning the marking; the matter has been taken up with the American Institute of Architects through their Lincoln Highway Committee, of which Elmer C. Jensen of Chicago is chairman.

The wild and desolate beauty of the country through which the Lincoln Highway travels in Utah gives a splendid opportunity for the erection

of the most striking Lincoln Highway designs, and in their creation Mr. Jensen will secure the co-operation of the best architects of the country.

To Aid Artists Seeking War Service

So that artists and decorators may be advised by experts as to the branch of war service for which their talents best equip them a new committee, known as the Committee on Arts and Decorations of the Mayor's Committee on National Defense in New York, has been formed and an information bureau opened in the Hall of Records. All matters pertaining to the services in war work of painters, architects, sculptors and decorators will be referred to this committee, the chairman of which is Albert Eugene Gallatin.

Other members of the committee are Lloyd Warren, vice-chairman, and Edward P. Gaston, secretary. The Executive Committee is composed of Dr. Nicholas Murray Butler, president of Columbia University; Guy Pene du Bois, William J. Glackens and Thomas Hastings.

War Wage Increases

Statistics for 600,000 factory employees in New York State during March show that the number of workers had increased 1 per cent over March, 1917, and that the total amount of wages paid had increased 20 per cent. During the same time the retail cost of food increased 21 per cent.

An Art Association Formed

Representative artists and art dealers in New York have formed an organization to promote the art interests of the country and to foster trade and commerce in art. A delegation from this association will soon visit Washington to take up the subject of art legislation with members of Congress.

Personal

Wellington W. Taber, architect, of Syracuse, N. Y., has been appointed to the position of Government supervising engineer of construction. He has been assigned to duty at Fort Ontario, Oswego.

H. D. Rawson, architect, of the firm of Proudfoot, Bird & Rawson, 810 Hubbell Building, Des Moines, Iowa, has been commissioned a major in the United States Army, and has been assigned to duty at Aberdeen, S. D.

Department of Architectural Engineering

Film Exchange Regulations

DURING the past ten years the motion picture industry has developed probably more rapidly than any other modern business. This expansion has been so rapid that the relations between this business and its neighbors have not always been properly adjusted. The hazard attending the production, storage and use of motion picture films were not understood or appreciated until disastrous experience indicated the necessity of a scientific investigation of the subject.

A proper realization of these hazards was promoted by such accidents as that which occurred in the smoking car of a suburban train at Chicago on November 24, 1914. A passenger entered a combination smoking and baggage car with four reels of motion picture films wrapped in paper. A lighted match, cigar or cigarette ignited the package, resulting in the death of two persons and the burning to some degree of thirty-eight persons. The interior of the car was destroyed, entailing a damage of about \$3,500. The Interstate Commerce Commission had made certain rules governing the transportation of films, but a general ignorance on the part of the public, many dealers and the police powers of the hazards involved made them inoperative to some extent. It seemed that such accidents as the one just cited were necessary to awaken the public to the menace of the nitro-cellulose or "gun-powder" films.

The use of these highly inflammable films has been prohibited in France since July 1, 1915. The very small extra cost of the nitro-cellulose film over that of the slow-burning kind has as yet prevented the prohibition of their use in this country.

An amusement industry always regulates its activities according to the box office returns and opposes any regulations which entail a reduction of profit, although these regulations are for the safety and welfare of the public. The fire record of this industry as published in the *Quarterly* of the National Fire Protection Association, January,

1918, gives among the common causes of fires in connection with the handling of films the percentage of 28.5 per cent to lighting equipment and 52.4 per cent to smoking. It is claimed by some that amusement enterprises employ, to a great extent, an irresponsible class of labor, and the above figures might indicate that such is the case and that fool-proof regulations are a necessity when these enterprises are concerned.

The National Fire Protection Association has ever been in the forefront in investigating all things which appertain to fire hazards and recommending means to combat these dangers. The reports and recommendations of their Committee on Explosives and Combustibles have kept pace with the development of the film industry, and in 1915 a special committee in charge of tests was organized, of which Mr. F. J. T. Stewart, Superintendent of the Bureau of Surveys, New York Board of Fire Underwriters, was chairman. The results of these tests were published in the *Quarterly* of the N. F. P. A., July, 1915. The purpose of the tests was to supplement those made by the U. S. Geological Survey in 1910.

These tests were in three divisions. The first tests were made in small containers of 3 cubic feet capacity and to measure the pressure generated by burning films in a closed place. The other tests were to investigate the conditions caused by burning films in a vault and in a fireproof metal cabinet. As a result of these tests recommendations were made by the N. F. P. A. to govern the construction of film storage vaults and cabinets. An isolated test vault was built 6 feet 4 inches x 3 feet 6 inches x 6 feet high, inside dimensions, with only one opening 18 x 22 in. in size. Pressure gages and pyrometers were installed in the vault. The contents consisted of 1490 pounds of film in metal containers, 250 pounds in naked rolls placed between groups of containers, and 160 pounds of loose films in three burlap bags to act as a torch.

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The opening had a wire screen and a thin glass installed in a wood frame, and between ten and fifteen seconds after the film was ignited the wire screen blew out, which reduced the pressure from 4 ounces to zero. At about 105 seconds after the ignition one of the burlap bags was blown out



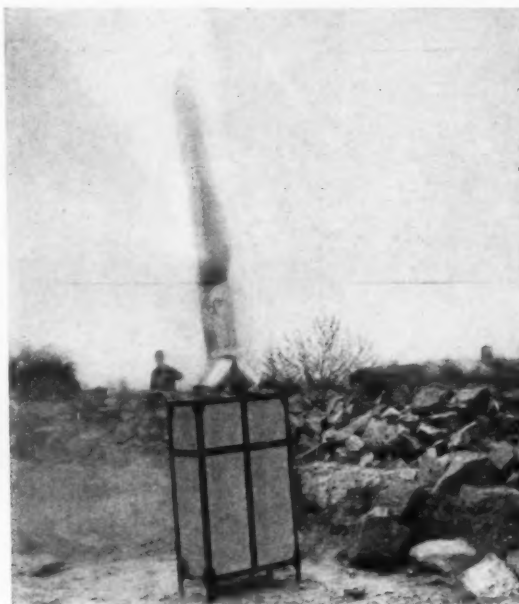
TEST VAULT IN ACTION

This flame extended horizontally a distance of 70 feet from pressure relief opening and was 8 feet in diameter.

through the opening to a distance of 50 ft., taking with it the glass and frame, increasing the vent opening from 285 to 396 square inches in area. A maximum pressure of 8 ounces and a temperature of 1120 degrees Fahr. was attained just before the bag was blown out. A flame 70 ft. long and 8 ft.



FILM CABINET CHARGED FOR TEST



FILM CABINET UNDER FIRE

Flame extending 12 feet above vent pipe, which had 76.6 square inches area.

in diameter issued from the vent. It began about 30 seconds after the film was ignited and lasted about 90 seconds. The flame was sufficiently hot to spall rocks about $\frac{1}{4}$ to $\frac{1}{2}$ in. deep which were in its path. The heat was unbearable 30 ft. distant at the



VIEW OF OPEN CABINET AFTER FIRE

sides and the temperature of the flame is estimated to have been at least 1700 degrees.

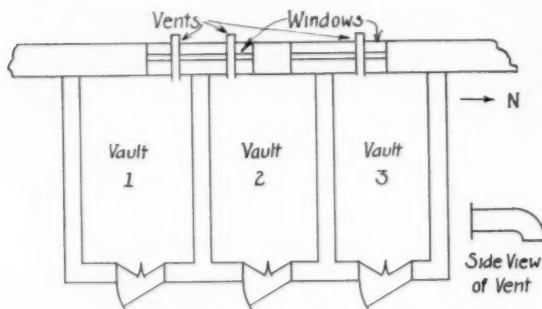
The cabinet had two compartments with a capacity of 40 reels (200 pounds) in each compartment. Each compartment had a vent opening of 38.48 square inch area, joined into a combined vent



CONSUMERS' BUILDING, CHICAGO

Effect of fire on Quincy Street front. Belt course destroyed at fifth story sill line. Fire entered fifth to eighth stories from fourth story.

of 76.6 square inch area. As each reel did not weigh the average of 5 pounds, a total of 290 pounds was all that could be stored in the cabinet. All, except about 50 pounds, were in separate metal containers. The film was ignited in one compartment by a match applied to a piece of film which



CONSUMERS' BUILDING, CHICAGO

Plan of vaults.

extended outside between the door and the cabinet frame at the bottom. Immediately smoke and flame shot up through the vent pipe for a distance of 12 feet and about 25 seconds after ignition the films in the other compartment ignited. A small flame issued from the door of the first compartment, and it is uncertain whether ignition in the second compartment was due to the flame issuing around the door or through the vent pipe or to heat transmitted through the dividing partition. Flames issued from the vent pipe for about 3 minutes. After the test

the walls of the cabinet were very hot and a large percentage of the containers were found open. No temperatures or pressures were obtained in this test.

On July 1, 1917, a fire occurred in a film exchange located on the fourth floor of the twenty-one-story Consumers' Building, Chicago. The fire occurred at 3:11 a. m. and appears to have started in a storage vault and resulted in a damage of \$58,872 to the stock and building. The vaults were placed against some bricked-up windows, through which some ventilating ducts had been placed. The fire coming through these ducts damaged the building



CONSUMERS' BUILDING, CHICAGO

Damage from improperly installed vent ducts from vaults.

and illustrated the necessity of carrying such ducts to a point where adjoining construction cannot be damaged. A slight explosion, undoubtedly due to confined heat and gases, blew out the windows on the street front and permitted the fire to enter the floors above from the fifth to eighth floors inclusive. The enameled terra cotta belt course at the fifth floor sill line was badly damaged, having its soffit and face destroyed. The displacement of these surfaces in hollow burnt-clay material is due to the more rapid expansion of the surface covering than that of the interior webs, causing a separation of the two parts. On the alley side the wire glass windows were melted on the floor above and cracked on the floor below. The fire entered and damaged the fifth to eighth floors of the building on the opposite side of the 12-ft. alley, causing a loss of \$15,000 to that building.

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Carelessness was shown in the operation of this exchange, scrap film was found on the floor of the repair room and in the paper rubbish of the paper baling press. Several open reels were on a table in the shipping room and two reels in the repair room. About one-third of the films stored in vaults Nos. 1 and 3 were not in containers, being stacked on the racks in open reels. The films in No. 2 were in a pile on the floor. The immense volume of smoke and fumes which passed to the various floors through the open grilles of the elevators made it impossible to use the elevators or stair shafts. It is fortunate that the fire occurred during the night. This is cited as one of the many serious fires that have occurred in such occupancies and is used to illustrate the very dangerous hazard that always pertains to such places and the vital necessity of securing every possible protection from these dangers.

Recent legislation has been enacted in Pittsburgh and Chicago to regulate the construction and conduct of film exchanges. They vary in some details as required by local conditions.

The Pittsburgh Code limits such occupancy to buildings not over six stories or 80 feet in height. This is done for the reason that Pittsburgh's fire-fighting apparatus reaches 80 ft., and to make quick rescues possible and safeguard the lives of boys and girls who usually work in such places the wisdom of this regulation is seen. They also permit only related occupancies in a building housing film exchanges. Related occupancies are defined as "offices for the conduct of the business and for the storage, handling and shipping of posters for motion picture exhibitions, exhibition machines, supplies, and the shipping thereof shall be permitted if such joint occupancy is separated from the portions used for the handling of films by fireproof partitions." The manufacture of nitro-cellulose and like motion-picture film is prohibited within the city limits. It will be seen that a building with an occupant of this kind can only house such occupants and related occupancies as defined. With regard to permitting only related occupancies in motion picture exchange buildings, it will readily be seen that the danger attendant on this industry will not be spread variously over mixed occupancies in a very large building, and it will have a tendency to segregate the danger. A concurrent result, however, of exceeding interest to those familiar with this work can be noted. Buildings with this kind of occupancy which are of the unusual severe type of construction, made so at considerable expense in order to fit the danger attendant upon the occupancy, are of a permanent character. The fact that other buildings are usually not so well protected from the standpoint of fire will tend to deter the shifting of occupancies or the

moving of tenants from building to building, thus safeguarding the extra investment of the owner for one thing and making it easy for the building inspector to keep track of the location of these occupancies. The real estate interests of Pittsburgh favored these restrictions, says Mr. John A. Ferguson, secretary-engineer of the Code Committee, after they found out how it was going to operate.

Vaults of 1000 cubic feet of contents with an effective vent area of four square feet for this contents are permitted. Vent areas reduced in proportion to the reduction of vault contents are permitted. The film inspectors in any one room are limited to ten in number. Otherwise the code is very similar to the Chicago Code here given in detail. The Pittsburgh Code Committee deserves great credit for the high standard they have set in their work.

The Chicago Code originated in the Bureau of Fire Prevention and Public Safety, through Chief J. C. McDonnell and Mr. C. W. Hejda, chief engineer of the Bureau. The Consumers' Building fire showed so conclusively the necessity for better protection that these gentlemen took vigorous action which resulted in the very complete ordinance recently enacted. It is given complete, except for the license and inspection regulations, which will vary with the organization of the license and police powers of cities.

A film exchange is a busy place from 11 o'clock p. m. until about 3 or 4 o'clock a. m., receiving the films from local theaters after they close and preparing express shipments for early morning trains. During the forenoon, express shipments are received and outgoing films are sent to local theaters. The inspection and repair of films is conducted during the regular daylight working hours.

The passage of these codes will probably result in the erection of buildings for this specific occupancy, and the rigid requirements will justify such structures, as the ordinary building cannot be made to conform to the requirements without great expense in the way of alterations. Such an investment almost guarantees a continued occupancy, which is a valuable consideration to the owner.

Acknowledgment is made to the *Quarterly* of the National Fire Protection Association and the Bureau of Explosives of the American Railway Association for the use of the illustrations here given.

The Chicago Code is as follows:

SECTION 184. License Required.

(a) No person, firm, co-partnership or corporation shall keep or store more than a total of two thousand (2,000) feet of motion picture films, whether in the form of positives or negatives, whether new or used, or discarded scrap of same, for the purpose of storing, manu-

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facturing, dealing in, selling, leasing, renting or exchanging same, unless such person, firm, co-partnership or corporation shall first make application in writing to the Chief of Fire Prevention and Public Safety for a license so to do, setting forth in such application the name, residence and occupation of the applicant if an individual or applicants if a co-partnership, or if a corporation, its name, principal place of business and the names and residences of its officers. Such application shall set forth the location at which it is desired or intended to keep or store such motion picture films, positives or negatives, or discarded scrap of same, and the number of feet of such films to be kept or stored at that location. No demonstration or handling of such films in such places and in connection with the manufacture, storage or keeping of same shall be allowed except as hereinafter provided.

(b) The term "Manufacturing" as used in this article shall be held to mean and is hereby defined as meaning the exposing, developing, fixing, printing, perforating and otherwise preparing motion picture films for the exhibition of motion pictures.

(c) The business or process for recovery of nitro-cellulose base shall not be permitted within the City of Chicago.

Sections 185 and 186 relate to the investigation by the Chief of the Bureau of Fire Prevention and Public Safety on the application for license and the premises to be occupied and the granting of license and the fees required.

SECTION 187. *Films—Building Requirements, Handling and Demonstration.*

(a) It shall be unlawful for any person, firm, co-partnership or corporation to keep or store within the City of Chicago any motion picture films, whether in the form of positives or negatives, whether new or used, or discarded scrap of same, in any building or structure of wood frame construction or in any other building or structure exceeding two stories in height unless such building is of fireproof construction as defined in Chapter XVI of The Chicago Code of 1911, as amended.

All buildings wherein motion picture films, whether in the form of positives or negatives, whether new or used, or discarded scrap of same, are kept or stored, shall be equipped in all stories containing film occupancies and in all stories above such stories containing film occupancies, with an approved system of automatic sprinklers. (Throughout this article the word "approved" when applied to a system or device shall be construed to mean any system or device that complied with the rules and regulations of the National Board of Fire Underwriters at the time of the passage of this ordinance or is deemed equally efficient by the Chief of Fire Prevention and Public Safety. All elevators and stairs in fireproof buildings shall be enclosed in all stories containing film occupancy and in all stories above such stories containing film occupancies, with walls of brick at least eight (8) inches thick or of reinforced concrete at least four (4) inches thick or of clay tile at least four (4) inches thick, and in non-fireproof buildings such enclosures shall be of brick at least twelve (12) inches thick. All openings into such elevator, stairway or other enclosures shall be equipped with single automatic or self-closing fire-doors. Doors into passenger elevator enclosures will not be required to be automatic or self-closing.

(b) It shall be unlawful for any person, firm, co-partnership or corporation keeping or storing any motion picture films within the City of Chicago to store the same in any manner other than by depositing such films in individual boxes of No. 24 U. S. gauge galvanized metal having tight fitting covers or in cases provided for in Section 195, which shall at all times while not being handled be stored in fireproof vaults, as provided for in Section 190; or a cabinet as provided for in Section 191.

SECTION 188. *Inspection of Premises by Chief of Fire Prevention and Public Safety.* It is hereby made the

duty of the Chief of Fire Prevention and Public Safety to inspect, or cause to be inspected at intervals of not greater than two months, all places wherein motion picture films are manufactured, kept or stored, with a view of determining whether or not the provisions of all of the ordinances of the City of Chicago relating to the manufacture, storage and keeping of motion picture films are being complied with, and wherever any violations of this article are discovered he shall close said building, or place of business, or take such consistent action in the interest of public safety as conditions warrant.

SECTION 189. *Motion Picture Machines—Construction and Mode of Operation.* Motion picture machines shall be of a type approved by the Commissioner of Gas and Electricity.

SECTION 190. *Vaults for the Storage of Motion Picture Films.* (a) It shall be unlawful to store motion picture films in vaults which do not comply with the following requirements: In non-fireproof buildings vaults shall be of brick or of reinforced concrete, the floors and tops of such vaults shall be of brick or of concrete or of reinforced hollow tile at least twelve inches thick or of reinforced concrete at least eight inches thick. In fireproof buildings vault walls shall be of fireproof tile or of brick or of concrete or of reinforced concrete. The floors and tops shall be of brick or of concrete at least twelve inches thick or of reinforced concrete at least eight inches thick or of fireproof tile or of reinforced hollow tile at least ten inches thick. The thickness of vault walls shall be of the same as herein specified for floors and tops where the same material is used for their construction, excepting that walls of fireproof tile shall be at least twelve inches thick.

Wood top flooring or any other combustible material with the exception of films shall not be allowed in vaults.

(b) The size of vaults shall not exceed 750 cubic feet, and the distance from floor to ceiling shall not exceed eleven (11) feet. Door openings into vaults shall be equipped with single standard No. 7 U. S. gauge vault iron doors and frames. Doors shall be automatic or self-closing. There shall be no other openings into vaults except for vent or fine pipe, or drainage pipe. Lighting shall be controlled by indicator switch located on the outside of vault. Only vapor tight globes equipped with wire guards and keyless sockets shall be used inside of vaults. No artificial heating appliance shall be allowed inside of vaults.

(c) Each vault shall be provided with a vent opening with an unobstructed area equivalent to 70 square inches for every one hundred reels of the capacity of the vault, based upon three reels for every cubic foot capacity of the vault. This vent opening shall be located in the ceiling or in a wall at the ceiling line. It shall be clear of any shelving or racks or other obstruction. The vent opening may be closed with sheet celluloid or single thick glass or paper not less than 200 square inch sheets. At least thirty-two (32) square inches of free open space shall be provided in each of such vent closers.

The said vent opening shall open into a separate vent flue of the same cross-sectional area as the unobstructed area of the vent opening. The vent flue shall extend vertically to the outer air. At its upper termination it may be constructed so as to prevent rain, snow or wind from entering the flue. The unobstructed opening into the atmosphere shall be not less in area than the area of the flue, and may be covered with a hood and louvers. The external opening of the flue shall at no point be less than ten (10) feet above the roof of the building, nor less than fifteen (15) feet distant from any door or window opening of the building or adjacent buildings. At a point not more than fifteen (15) feet nor less than ten (10) feet below the external opening into the atmosphere shall be not less in area and covering the entire area of same, a substantial wire screen made of No. 10 U. S. gauge galvanized wire, of two (2) inch mesh, with a substantial frame securely attached to the walls of the duct. Upon this screen shall be placed another screen made of No. 18 U. S. gauge galvanized wire $\frac{1}{4}$ -in. mesh.

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Vent flues shall be built without holes, openings or open joints in their walls and no holes or openings of any kind shall be made in their walls after construction.

In non-fireproof buildings the construction of said vent flues shall be the same as is required for smoke flues of the same area for such buildings. In fireproof buildings such vent flues may have four-inch walls of reinforced concrete or four-inch walls of fireproof tile with the voids set vertical and filled with concrete and the flue structure properly reinforced and anchored against expansion through intense heat. Such other construction of vent flues will be permitted as will meet with the approval of a Board consisting of the Commissioner of Buildings and the Chief of Fire Prevention and Public Safety as being equal in character to the foregoing.

(d) Each vault shall be equipped with approved automatic sprinklers; one sprinkler head shall be provided for each 1000 pounds of film capacity of such vault. The openings in the heads shall not be less than one-half ($\frac{1}{2}$) inch in diameter.

No. 24 U. S. gauge galvanized iron baffle plates reinforced with rolled bottom edge shall be attached to and suspended from the ceiling of the vaults and shall be so arranged that they shall be midway between adjacent heads, and shall extend six (6) inches below the level of the deflectors on the heads.

(e) Shelves or racks to support the film containers shall be of metal and of open construction and shall be so arranged that the film containers shall stand on edge; an air space of at least one-quarter ($\frac{1}{4}$) inch shall be maintained between adjacent containers. Film containers within the vaults shall be placed only in the above described manner. The top of the topmost containers shall not be higher than the bottom line of the baffle plates between the sprinkler heads.

SECTION 191. Cabinets for storage of films, construction, Use of. Motion picture films, whether in the form of positives or negatives, whether new or used, or discarded scrap of same, may be stored in an approved ventilated metal cabinet, provided such cabinet is constructed of at least No. 18 U. S. gauge sheet metal, double walled, containing one-inch air space, and door constructed equivalent to cabinet. Doors shall be self-closing, shall fit closely at all points of contact, and shall be kept closed and locked. There shall be not more than one cabinet in any of the premises of any occupant, and the capacity of such cabinet shall not exceed fifty reels or two hundred and fifty pounds of such film. Each such cabinet shall be ventilated directly to the outside atmosphere through a duct which may be run horizontally or vertically. The sectional area of such duct shall be not less than thirty-six (36) square inches. The duct shall be constructed of No. 18 U. S. gauge galvanized sheet metal with riveted joints and covered with one (1) inch in thickness of approved heat insulation material protected with one thickness of No. 26 U. S. gauge galvanized sheet metal. All such flues shall be kept at least nine (9) inches away from all combustible material. The outside openings of such flues shall be at least fifteen (15) feet distant from any opening into any other building, or unprotected openings in the building in which such cabinets are located, and they may be protected against the elements, provided such protection does not reduce the flue area or efficiency.

All cabinets shall be equipped with approved automatic sprinklers; one sprinkler head to be installed in each cabinet.

SECTION 192. Use of Non-Inflammable Films. Nothing contained in this article shall be held to abrogate the provisions of an ordinance relating to the use of non-inflammable films, the provisions of which are subject to enforcement by the Department of Gas and Electricity.

SECTION 193. Examining, Repairing and Distributing of Films.

(a) In buildings of fireproof construction examining and repairing of motion picture films shall be done only in rooms or compartments enclosed in partitions of fire-

proof or incombustible material at least four inches thick. Such partitions and the enclosing walls of such room except where same face upon a public street at least fifty feet wide shall have window openings in same equipped with approved metal frames and sash glazed with wired glass, and all door openings shall be equipped with approved single automatic-closing fire doors. Each room shall not be used by more than two inspectors at one time if inspection tables are located in the middle portion thereof and by not more than four inspectors if the inspection tables are set against the side walls of such room and in such manner that not more than two inspectors face each wall, and provided that a space of not less than four and one-half ($4\frac{1}{2}$) feet is allowed between tables for exitway and the door used for exit. Such rooms shall be provided with direct means of egress without passing through the receiving, shipping or distributing rooms.

Not more than a total of six motion picture films for each inspector shall be permitted in such rooms or compartments at any one time. Such films shall at all times be kept in metal cases, as specified in Section 195 of this article, except such time as each individual film is undergoing actual inspection. The metal cases shall be kept closed at all times except while a film is being inserted therein or extracted therefrom. No combustible material other than films and necessary film repair materials shall be kept, stored or handled in said room, provided, however, that window frames of windows facing public streets may be of wood with ordinary glass.

Such rooms or compartments shall have adequate ventilation and be equipped with approved automatic sprinklers with one head for each sixty (60) square feet or fraction thereof of ceiling area and so spaced or distributed that the distance between heads shall not exceed seven (7) feet nine (9) inches; where distance between heads is less than seven (7) feet nine (9) inches, galvanized iron baffle plates as described in Section 190 (d) shall be provided. The openings in the heads shall not be less than one-half ($\frac{1}{2}$) inch in diameter.

In non-fireproof buildings in addition to all of the above requirements, the floors and ceilings of such rooms or compartments, if not built of fireproof construction must be taken out and replaced with floors and ceilings of fireproof construction as defined in Chapter XVI of The Chicago Code of 1911, as amended.

(b) Standard metal cans shall be provided where repairing is done. All scrap or waste from the films shall be kept therein and removed from the building daily to a safe location. Such waste shall be kept separate from paper waste or other rubbish.

(c) Any compound of collodion and amyl acetate or similarly inflammable cements shall be limited to one quart.

(d) Lighting shall be restricted to incandescent electric lamps in vapor-proof globes.

(e) Each examination and repair room shall be heated, if at all, only by hot air, hot water or steam, and a metal shield or screen shall be provided to prevent the films from coming in contact with radiators or heated pipes. No hot air floor registers shall be used.

(f) In fireproof buildings, receiving, shipping or distributing rooms shall be constructed with walls of brick or concrete at least eight (8) inches thick or of reinforced concrete or clay tile at least six (6) inches thick with approved single fire doors at openings. Enclosing walls and doors shall contain no glass other than wired glass in metal sash and frames except that windows facing public streets may be of wood with ordinary glass.

Receiving, shipping or distributing rooms shall have adequate ventilation and shall be equipped with automatic sprinklers with one head for each twenty-five (25) square feet of ceiling area and so spaced or distributed that the distance between the heads shall not exceed four (4) feet and ten (10) inches. Galvanized iron baffle plates as described in Section 190 (d) shall be installed in each such room.

No combustible material other than films shall be kept, stored or handled in said rooms, provided, however, that

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frames of windows facing public streets may be of wood with ordinary glass.

In non-fireproof buildings all of the above requirements shall apply, and in addition the floors and ceilings of the receiving, shipping or distributing rooms must be of fireproof construction as defined in Paragraph XVI of The Chicago Code of 1911, as amended.

SECTION 194. Smoking Prohibited. Smoking or the carrying of lighted cigars, pipes or cigarettes shall be prohibited in every room containing films of every establishment licensed for the storage and handling of films, and "NO SMOKING" signs shall be posted to that effect.

SECTION 195. Shipment and Transportation of Films.

Motion picture films, whether in the form of positives or negatives, whether new or used, or discarded scrap of same, shall not be taken to or from any of the places described in this article, or to or from any motion picture theater, or to or from any railway, express or transportation company's depot for removal, conveyance or shipment within the limits of the City of Chicago, or for shipments to or from the City, nor shall they be carried or transported through the public streets of the City, except in substantially constructed sparkproof cases made of sheet iron not less than No. 24 U. S. standard gauge and lined

throughout with fibre board at least one-eighth ($\frac{1}{8}$) inch thick, or some other equivalent insulating material. Corners of these cases shall be reinforced to withstand the wear and tear.

The covers shall be constructed of the same material and lined in the same manner as containers, and shall either be securely fastened to cases with substantial hinges, shall lap over body of cases at least five-eighths ($\frac{5}{8}$) inch all sides and have substantial self-locking locks, or shall be of the telescopic type, in which case covers shall lap over body of cases at least five (5) inches and shall be equipped with substantial straps so that covers may be firmly fastened to cases.

SECTION 2. Provided, that this ordinance shall apply only to buildings constructed after the passage of this ordinance and provided further that this ordinance shall apply to all buildings converted for use for film occupancy after the passage of this ordinance; and provided further that the provisions of Sections 184, 191, 195 and Paragraph B of Section 187 of this ordinance shall apply on and after the passage of this ordinance; and provided further that this ordinance shall not apply to buildings now occupied and containing film occupancies until May 1, 1919.

SECTION 3. This ordinance shall be in force and effect from and after its passage and due publication.



NITRO-CELLULOSE FILM IN A SMOKING CAR

Four reels of film in a paper wrapped package and a cigarette—two persons burned to death and thirty-eight badly burned. Car damage \$3,500.00. The film company saved a few cents; the public paid with valuable lives.

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Engineering Education and Student Shortage

THE Society for the Promotion of Engineering Education held its annual meeting at Evanston, Ill., June 26-29. The latest decisions of the Government concerning students' training camps and means of satisfying the increasing demands for engineers in war and industry, now and in the future, were the chief topics of discussion. The Western Society of Engineers and sections of the A. I. E. E. and the A. S. M. E., at one session presented the opinions of the practicing engineer.

The methods used in building up engineering organizations by public service corporations were described by W. L. Abbott, chief engineer of the Commonwealth Edison Co. of Chicago. Formerly a young graduate was put to work at \$2 per day with the gang. If at the end of a year the man was still on the job it was through no effort on the part of the company. His reliability and willingness to assume responsibility were the only means of bringing him to the attention of the employer. Under this scheme recruits failed to appear, and, the condition becoming general, a Central Italian Institute was established. In this 40 to 50 were trained each year, and in four years 85 were graduated, one-half of whom stayed with the company until the war began, when 85 per cent left, practically terminating the experiment.

The present method is to give a large part of the preliminary work during the vacation periods during the undergraduate days of the student, and for their work they are paid from \$60 to \$90 per month. As before, the men are shifted from one department to another to broaden their knowledge. While there are some drawbacks to this system, it promises to be satisfactory.

Further details of this meeting, as given in the *Engineering News-Record*, are of interest, and especially the address of the president, Prof. Milo S. Ketchum, on "Essentials in Engineering Education." The critical problem now is to provide a sufficient number of competent teachers. This can be done by improving the conditions and increasing the remuneration of engineering teachers so that the student can have instruction by men of thorough training in both theory and practice, who can fulfill the specifications for a good engineer.

A forceful paragraph was as follows: "A man with a disagreeable disposition ordinarily has no opportunity to use his technical ability except in a very inferior position. One of the most important advantages gained from technical education is con-

tact with other men and an appreciation of the value of human engineering. Of all the materials with which an engineer has to deal there is no material so difficult to handle and control as human material."

The trend of the time is clearly indicated. The employer is concerned with the individuality and progress of his workmen. He is forced to this attitude by the necessity of having a reliable and intelligent organization, and the day of an expert man being a mere numbered cog in the machine is past. The necessity of better and more business-like teachers will necessitate the payment of an adequate salary. That most important subject of human engineering is now a real problem, as the man is no longer a mere machine.

Government Establishes Division of Engineering

GOVERNMENT supervision of employment for technical men has been inaugurated by the United States Employment Service, through the establishment of a Division of Engineering with A. H. Krom of Chicago, formerly secretary of the American Association of Engineers, as director.

War demands on the engineering profession have already caused a serious shortage of men with mechanical designing experience and those with practical experience in chemical engineering. At present the professional organizing mediums reach less than 20 per cent of the estimated 300,000 technical men in the country. This is not a satisfactory arrangement for war times. All the technical men of the country must be reached and, in addition, all men with technical experience must be carefully registered so that they will be immediately available.

Greater engineering is needed to win the war, and the Government demands unity and efficiency in the technical profession to assure early victory. The highest efficiency is obtained through practical organization.

In consideration of the fact that this is principally an engineer's war, the importance of federal direction of proper distribution and conservation of the technical service of the country, is a very important matter. The service will be started through the office of the Director of Engineering, 29 S. La Salle Street, Chicago. All technical men desiring to register for emergency government work or permanent advancement in positions meeting their qualifications, are urged to volunteer at once for registration, classification and employment.

Industrial Information

A Glance Into History

In the large bulletin published by the Wright Wire Company, Worcester, Mass., a resumé of the development of the company is given, beginning with the launching of the business in 1883 at Palmer, Mass., and taking up the present scope and magnitude of the enterprise.

Ample illustration is afforded of the company's facilities for manufacture. There are a great many photographs of plant and products, as well as of the machines used to make the different wires. The second half of the book is given over exclusively to a consideration of "Wright Wire Products." It tells something of the widely varying types of wire included in this category, and points out by illustration and text the numberless uses to which such wire may be put.

"Trumbull Cheer"

Trumbull Cheer for July, the house organ of the Trumbull Electric Mfg. Co., of Plainville, Conn., illustrates and describes recent additions to the already large line of electrical accessories made by this company.

The particular feature of this issue is the line of externally operated knife switches with porcelain bases. The safety features are: Box cannot be opened when switch is in contact; switch cannot be closed when box is open, making it impossible at any time to come into contact with a live closed switch. The box can also be locked and sealed when switch is in open position. These features reduce to a minimum the liability to injury from electrical contact.

The Crane War Slogan

"Will to Win—Work to Win—Fight to Win," is the war slogan of the Crane Company, 836 South Michigan Avenue, Chicago. As evidenced through its house organ, *The Valve World*, this is the typical

attitude of mind of everyone connected with this company. The June issue is characterized by a deeply patriotic feeling, and should have most potent and commendable effects upon its readers.

Mention is made of the part the Crane Company is playing in this war, and of the valuable use in war service that is being made of Crane products. An important technical article, "Safety and Relief Valves for Marine Work," by M. W. Link, gives further evidence of this, as does the photograph of Kewanee portable boilers for the American Expeditionary Forces in France. These boilers are all equipped with Crane pop safety valves, extra heavy swing check valves, steam cocks and "Y" pattern blow-off valves.

Concrete Tanks for Oil Conservation

In the days in the oil industry when waste—avoidable waste—was figured as part of the cost, any container that would serve its purpose within a certain limit of wastage would answer.

To-day, with the need for saving or conserving everything that is required in war preparation, waste becomes a direct menace, and the Government has firmly and authoritatively stated that it will not be tolerated.

The Portland Cement Association, whose offices are in every principal city, has recently issued a pamphlet entitled "Concrete Tanks for Oil Conservation." In it there are illustrated and described many tanks that have been constructed for the storage of oil. These tanks, it is claimed, solve the problem of the most economical and least wasteful method of oil storage. It is claimed that when proper care has been taken to make a dense, compact lining in which all coarse material is well embedded below the surface, an oil-tight structure results. These tanks are suitable for light as well as heavy oil. A number of testimonials are printed in the pamphlet, which will be mailed on request, setting forth the success attained by many users of this method of oil storage.