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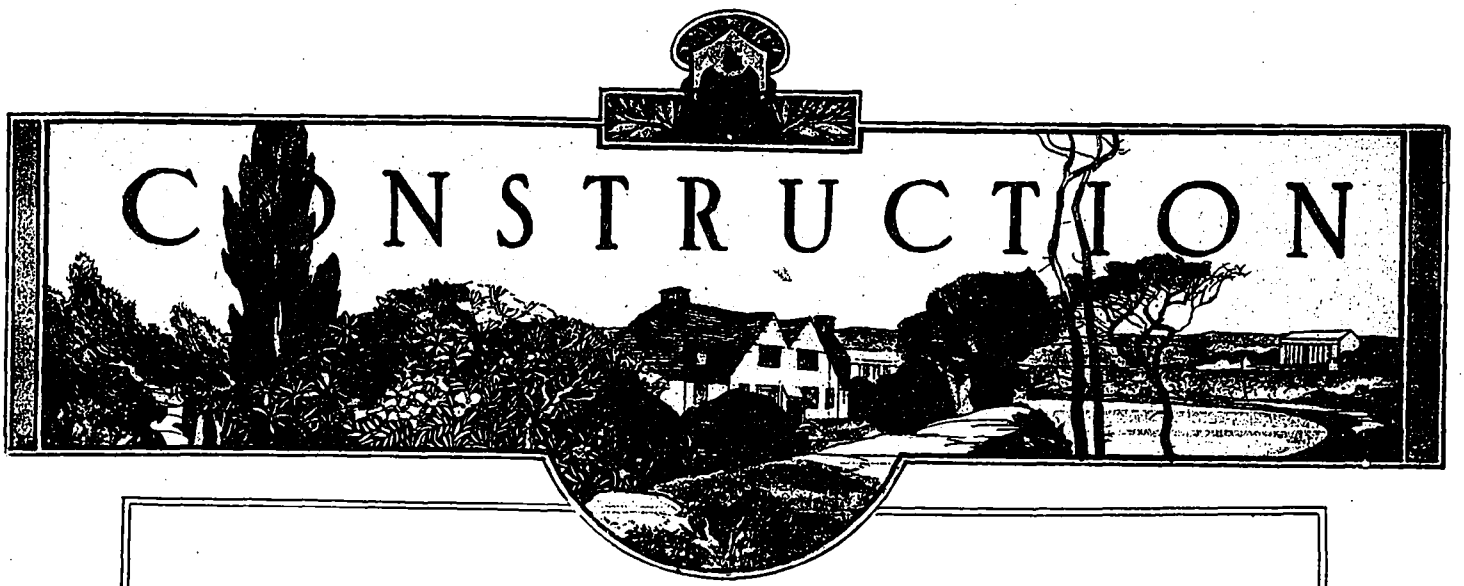

February, 1917 Vol. 10, No. 2

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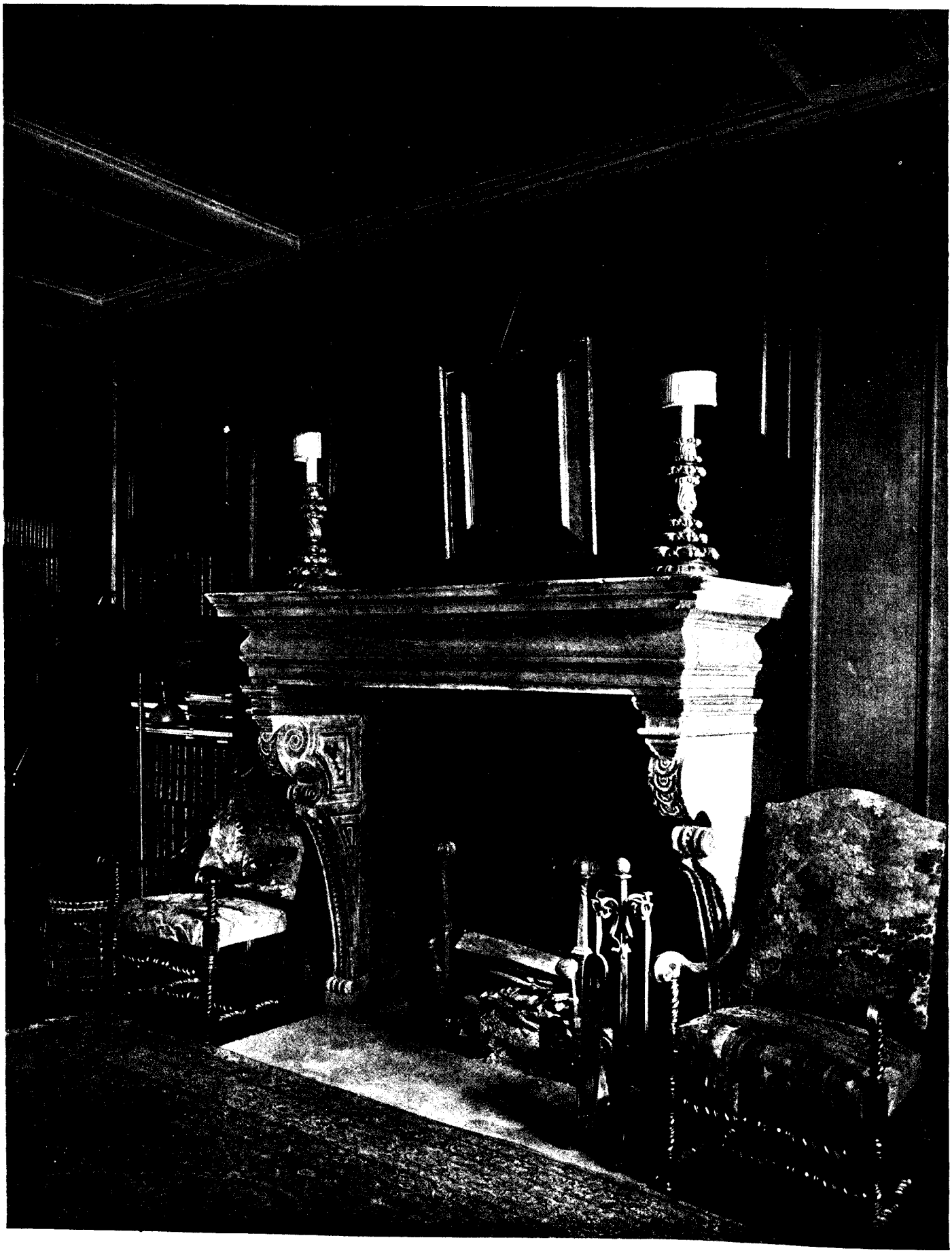
Full Page Illustrations

H. GAGNIER, Limited, Publishers
GRAPHIC ARTS BLDG., TORONTO, CANADA
BRANCH OFFICES
MONTREAL NEW YORK



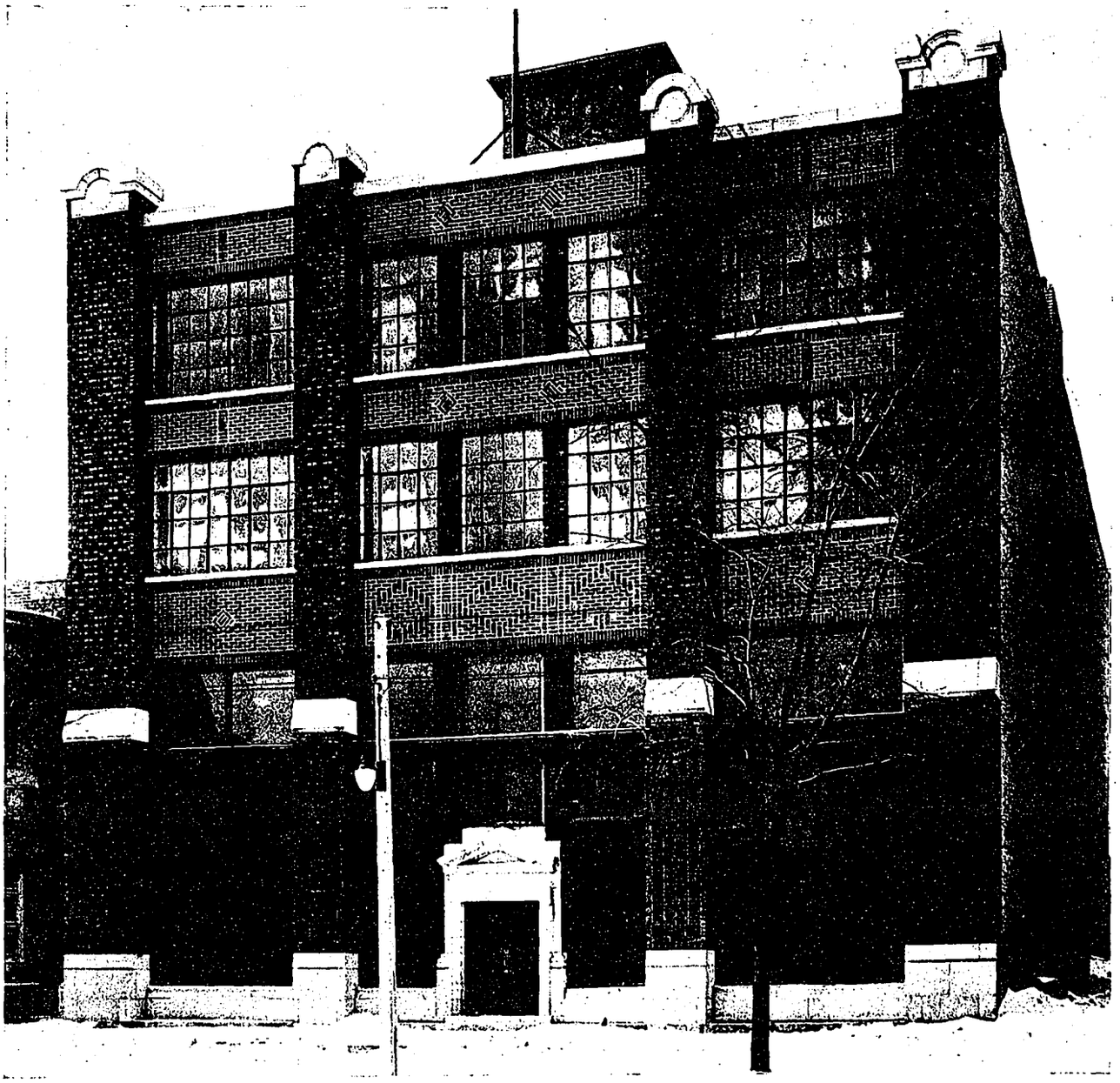
A LIBRARY FINISHED IN BUTTERNUT WITH A PAINTED AND DECORATED CEILING AND MANTEL IN THE ITALIAN STYLE. THE ANDIRONS ALSO ARE IN THE ITALIAN STYLE, BELONGING TO THE EARLY SIXTEENTH CENTURY. THE BOOKSHELVES LINE THE WALLS, SOLIDLY FROM FLOOR TO CEILING.

A Reinforced Concrete Garage, Toronto, Ont.

THE new home of the Automobile and Supply Company, Ltd., is located on the west side of University Ave., a short distance south of Anderson. It extends through to Simcoe Street, giving admission to the building from both ends. As University avenue is perhaps the greatest automobile thoroughfare in the city, and as its use for this purpose will probably very greatly increase in the future, the location is most undoubtedly an excellent one.

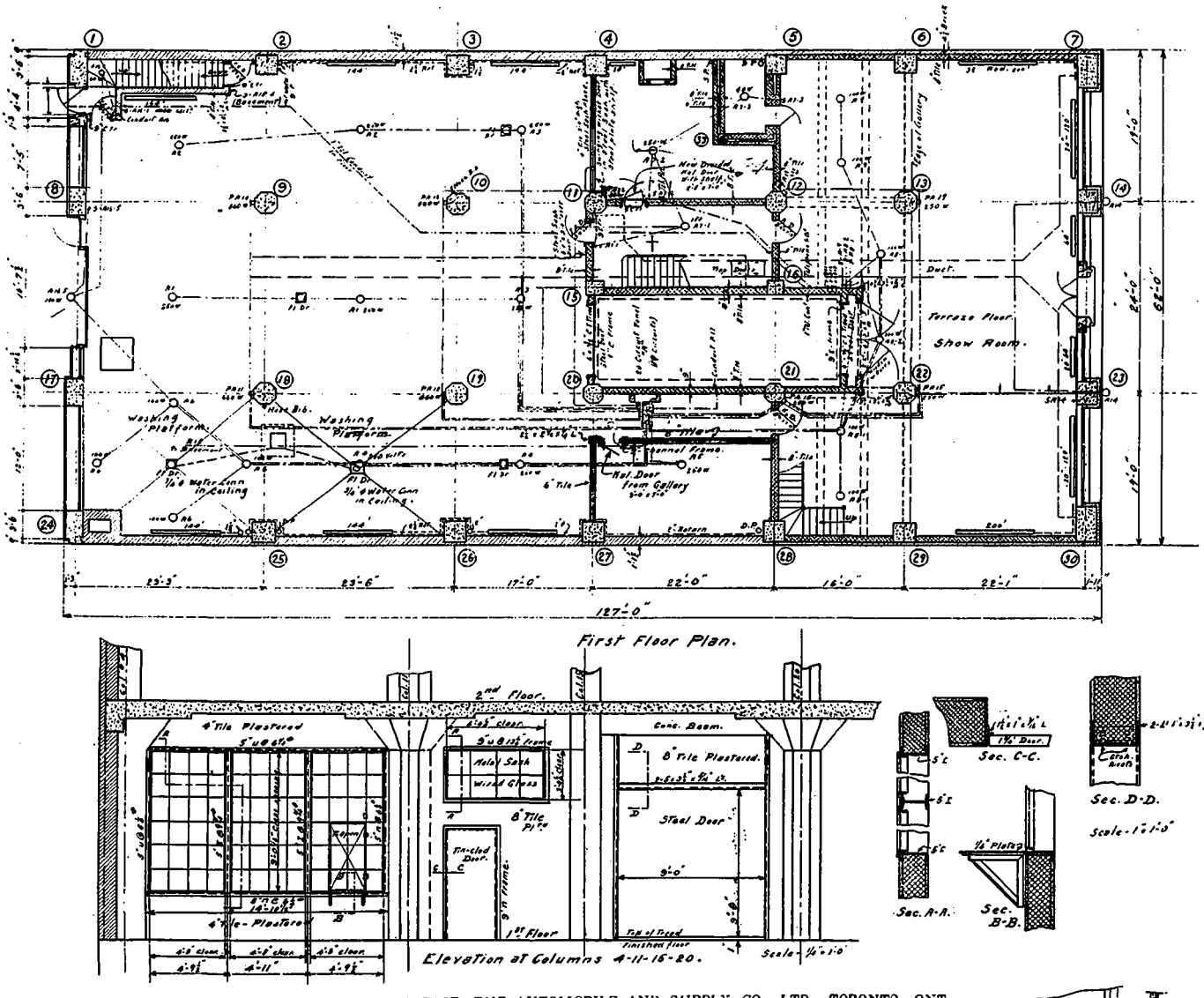
The building will be devoted to the sale, storage and repair of automobiles, and every facility for these purposes has been provided. It has a frontage of sixty-two feet on each street, and a length of one hundred and twenty-seven feet. It is four storeys in height, with a basement at the Simcoe street end.

The building is constructed of reinforced concrete with brick spandrel walls. The elevation on University avenue is faced with artificial stone and tapestry brick. The brick in the spandrels over the windows are buff in the centre of the panel and dark brown in the margin. The columns are faced with dark red brick with squares at the corners of the panels of enamelled green brick. The brick work joints are half an inch thick, and are raked out half an inch. On Simcoe street the concrete columns were allowed to show, only the spandrels over the windows being faced with brick. The outside columns and beams of the side walls are set back sufficiently to allow a course of brick to be carried

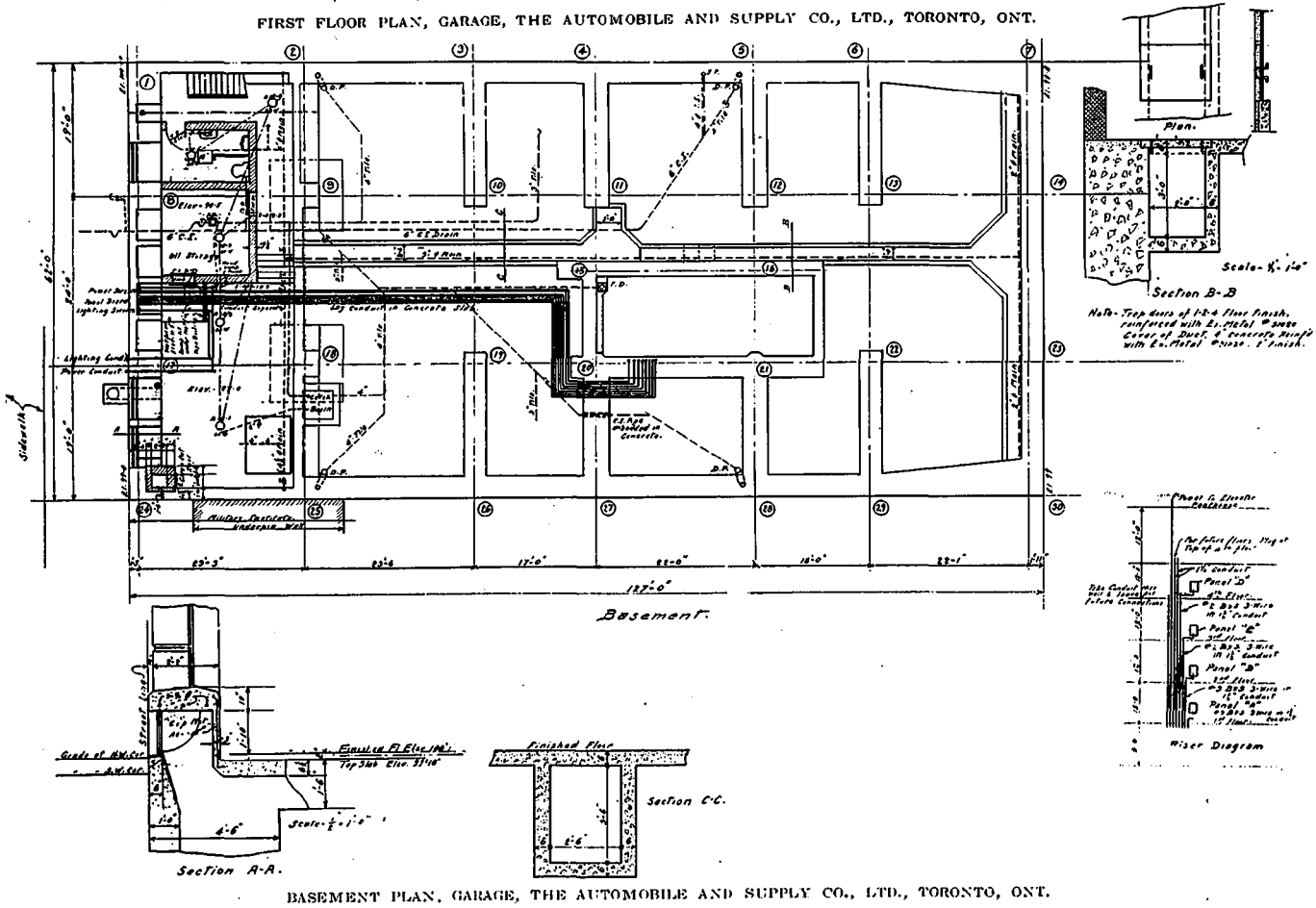


GARAGE, AUTOMOBILE AND SUPPLY CO., LTD., TORONTO, ONT.

HARKNESS & OXLEY, ENGINEERS. SHEPARD & CALVIN, CONSULTING ARCHITECTS.



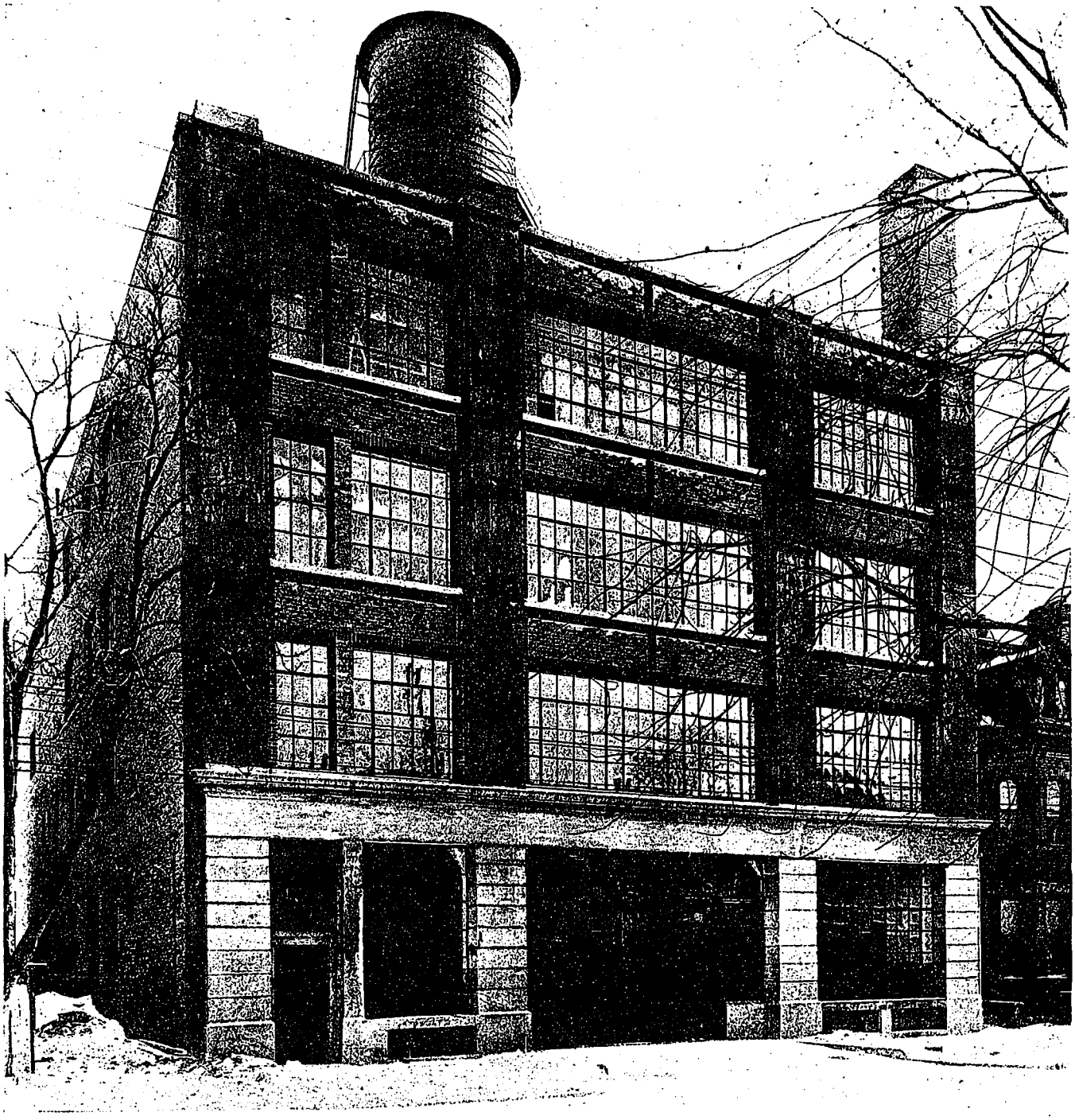
FIRST FLOOR PLAN, GARAGE, THE AUTOMOBILE AND SUPPLY CO., LTD., TORONTO, ONT.



BASEMENT PLAN, GARAGE, THE AUTOMOBILE AND SUPPLY CO., LTD., TORONTO, ONT.

past flush with the outside brick curtain wall, so that the columns and beams do not show on the side elevations. The spandrel walls of the office are built of interlocking tile, faced with brick on the outside, and plastered on the inside. The elevator pent house is also built of interlocking tile plastered both inside and outside. All interior partitions are built of eight-inch tile.

type of construction, with two-way reinforcing. The largest panel is twenty-four feet square. The slab is nine inches thick, and the drop heads twelve inches thick, and eight feet square. The columns and footings are designed for two additional storeys, the present roof being the future fifth floor. The elevator pent house has been arranged so that the two additional storeys

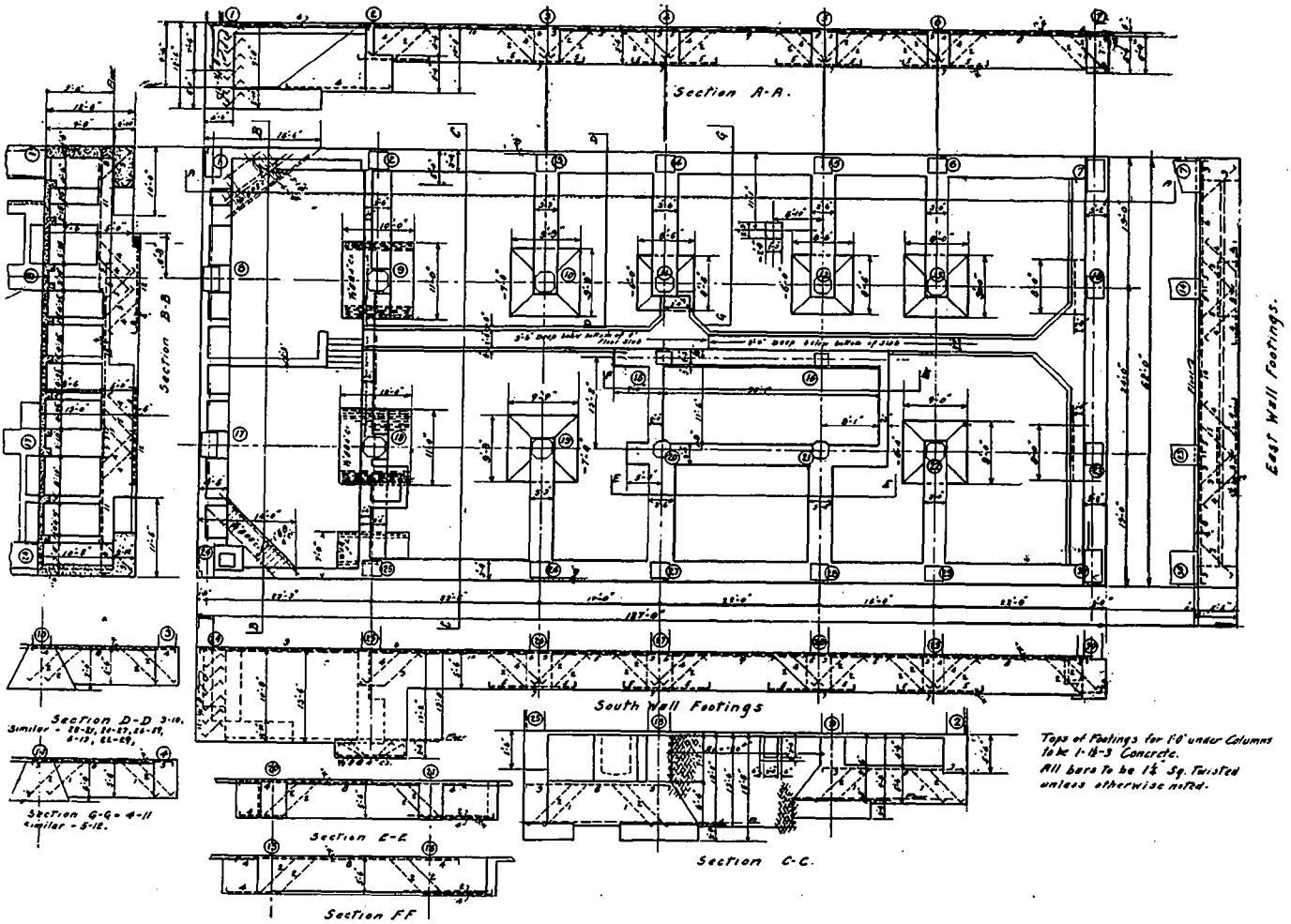


VIEW FROM SIMCOE STREET, GARAGE, AUTOMOBILE AND SUPPLY CO., LTD., TORONTO, ONT.
SHEPARD & CALVIN, CONSULTING ARCHITECTS.
HARKNESS & OXLEY, ENGINEERS.

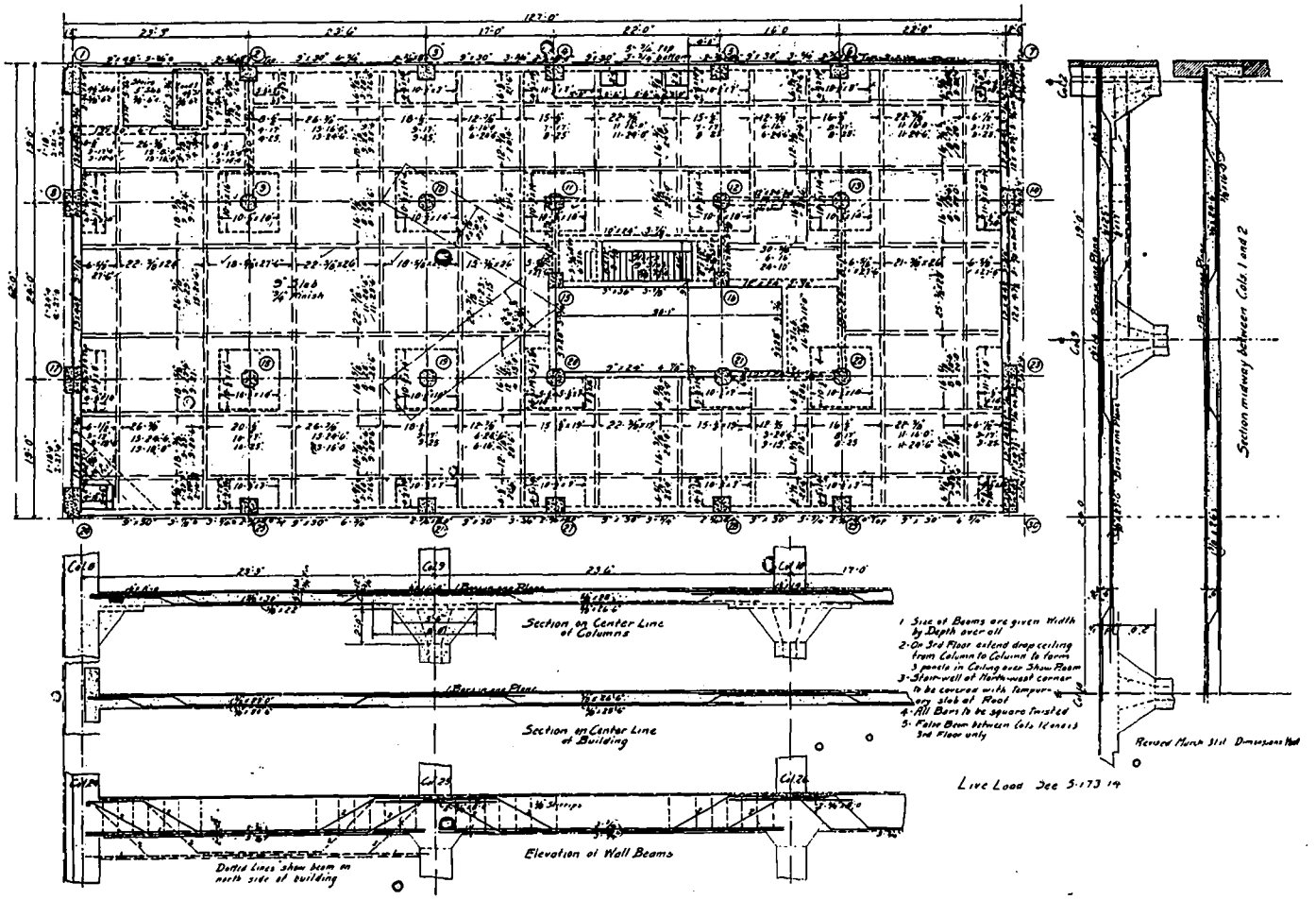
Door frames are constructed of nine-inch steel channels between the office and the garage, and the doors are all three-ply tin-clad, except where kalameined doors have been used. All corners of partitions are protected with steel angles.

The reinforced concrete is of the flat slab

can be added, and the building completed without interfering with the operation of the elevator. The floors were finished as poured with a one-inch surface of concrete, composed of one part of cement to one and one-half of sand, and three of trap rock not exceeding three-eighths inch.



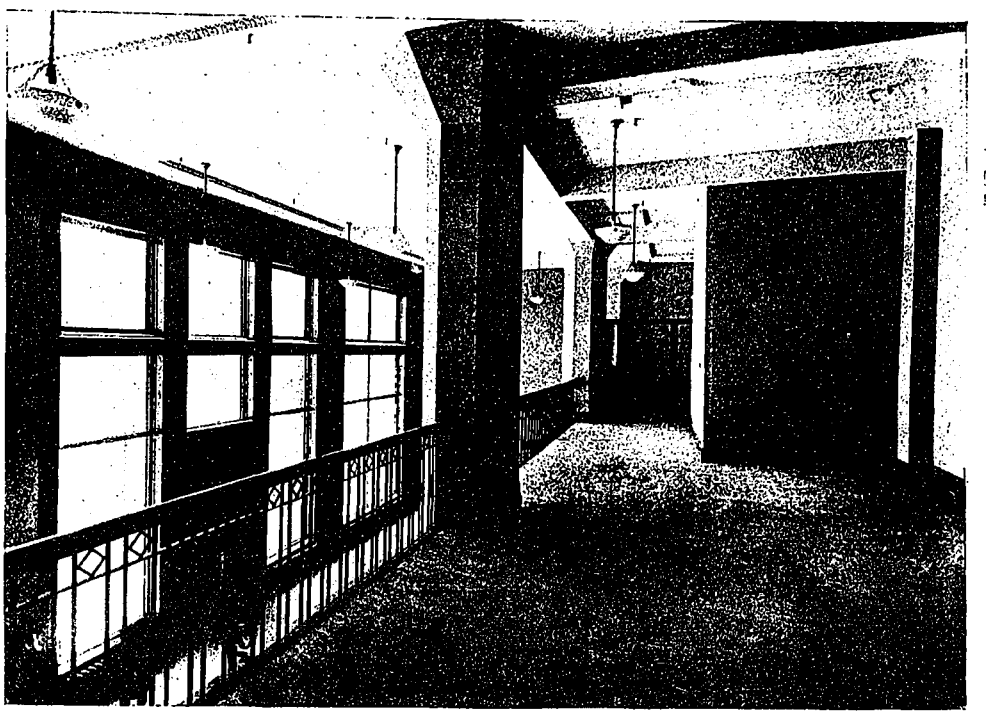
FOUNDATION PLAN, GARAGE, THE AUTOMOBILE AND SUPPLY CO., LTD., TORONTO, ONT.



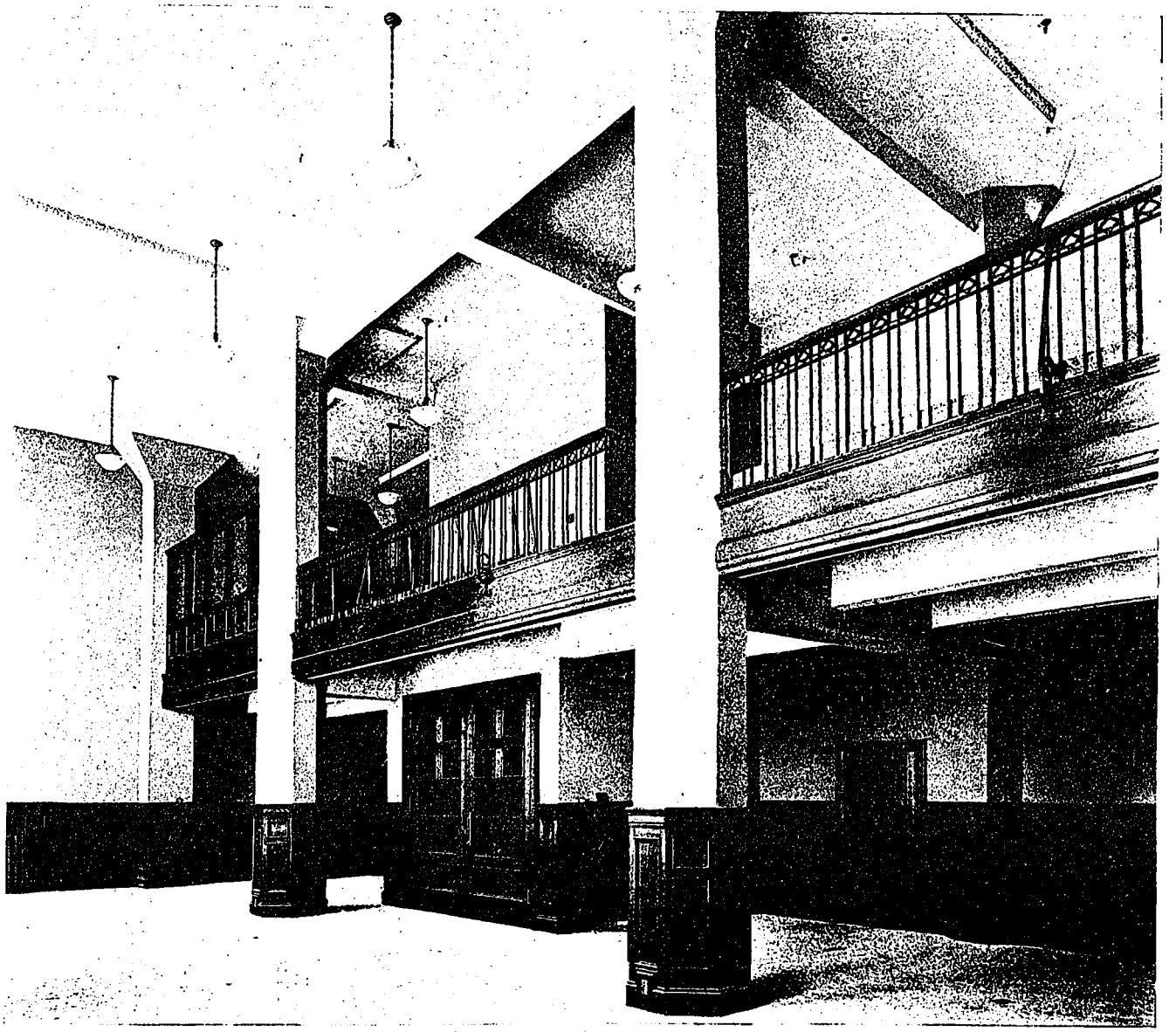
TYPICAL FLOOR PLAN, REINFORCED CONCRETE, GARAGE, THE AUTOMOBILE AND SUPPLY CO., LTD., TORONTO, ONT.

The foundations of the building are designed as continuous beams along the side walls, the eccentricity of the load being provided for by cantilever beams extending to the interior columns. The beams are of a uniform depth of five feet six inches. The unbalanced part of the load on the interior columns is carried by spread footings at the ends of the cantilever beams.

A large elevator is situated centrally in the building, the hall and stairs alongside occupying with the elevator the width of the outer bay. The showroom, about forty feet deep, is two storeys in

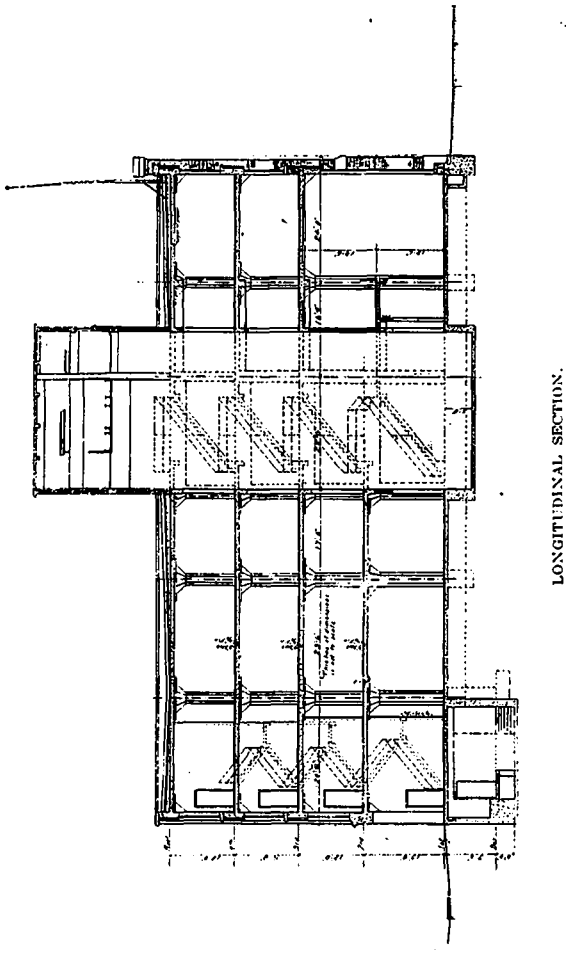


VIEW SHOWING OFFICE OVER SHOWROOM.

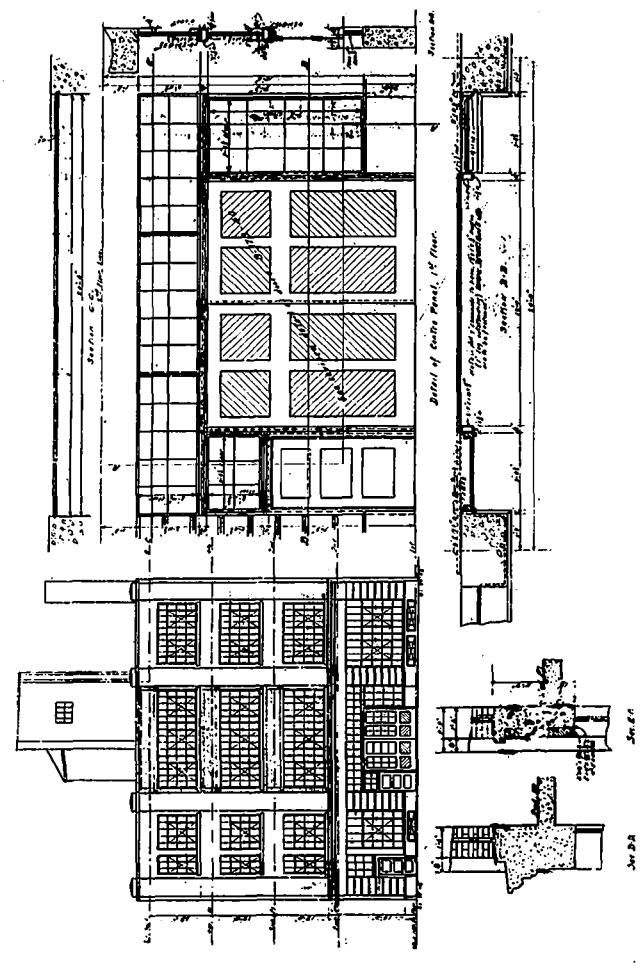


VIEW OF SHOWROOM AND OFFICE, GARAGE, AUTOMOBILE AND SUPPLY CO., LTD., TORONTO, ONT.

HARKNESS & OXLEY, ENGINEERS. SHEPARD & CALVIN, CONSULTING ARCHITECTS.



LONGITUDINAL SECTION.

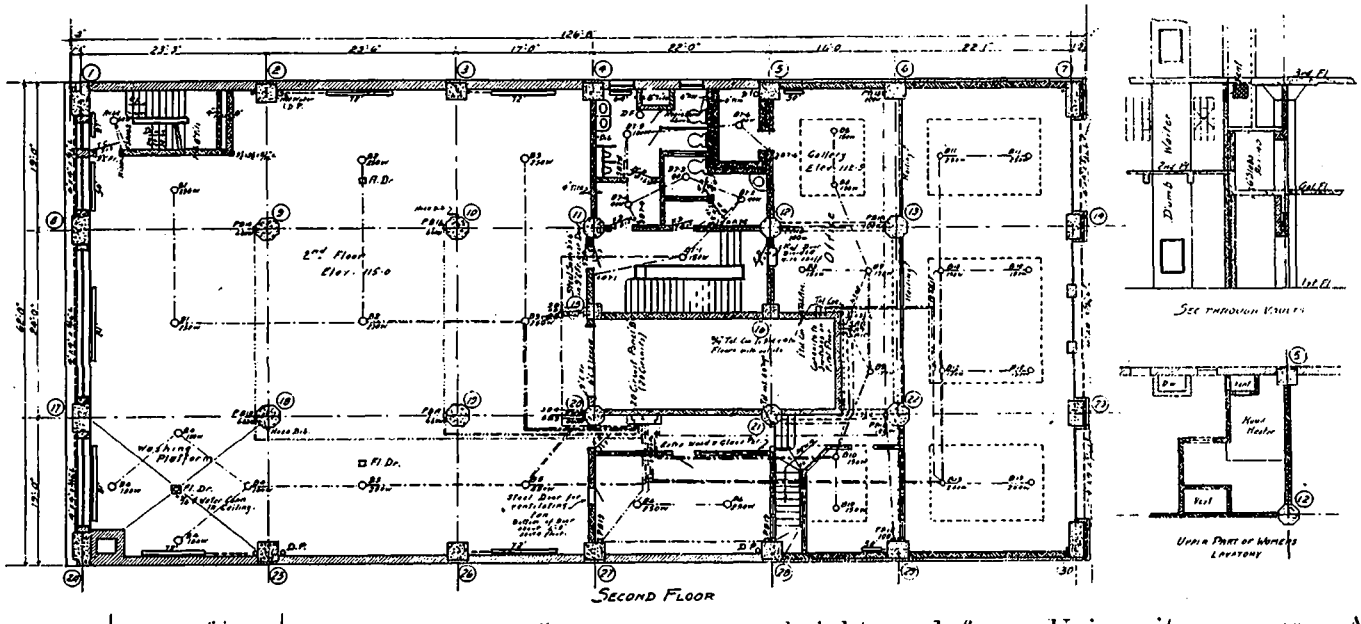


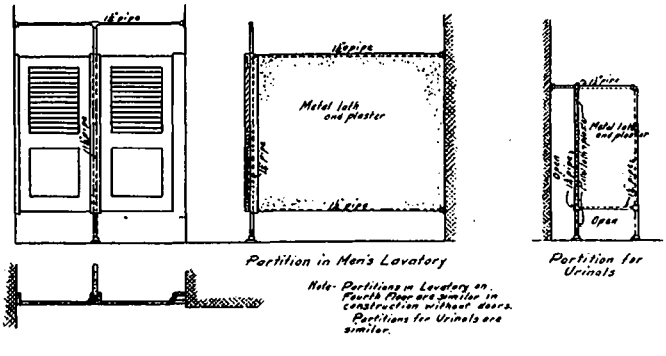
ELEVATION, SIMCOE STREET.

SHEPARD & CALVIN, CONSULTING ARCHITECTS.

HARKNESS & OXLEY, ENGINEERS.

SECOND FLOOR PLAN, GARAGE, THE AUTOMOBILE AND SUPPLY CO., LTD., TORONTO, ONT.





height, and faces University avenue. A gallery across the back of the showroom is used for office purposes. Access is had to the showroom for cars through the elevator, the entrance from University avenue being for pedestrians only. The garage entrance is from Simcoe street, and all service is supplied from this end. The basement, which occupies but one bay of the building, accommodates the boiler room, the oil storage room, and the air com-

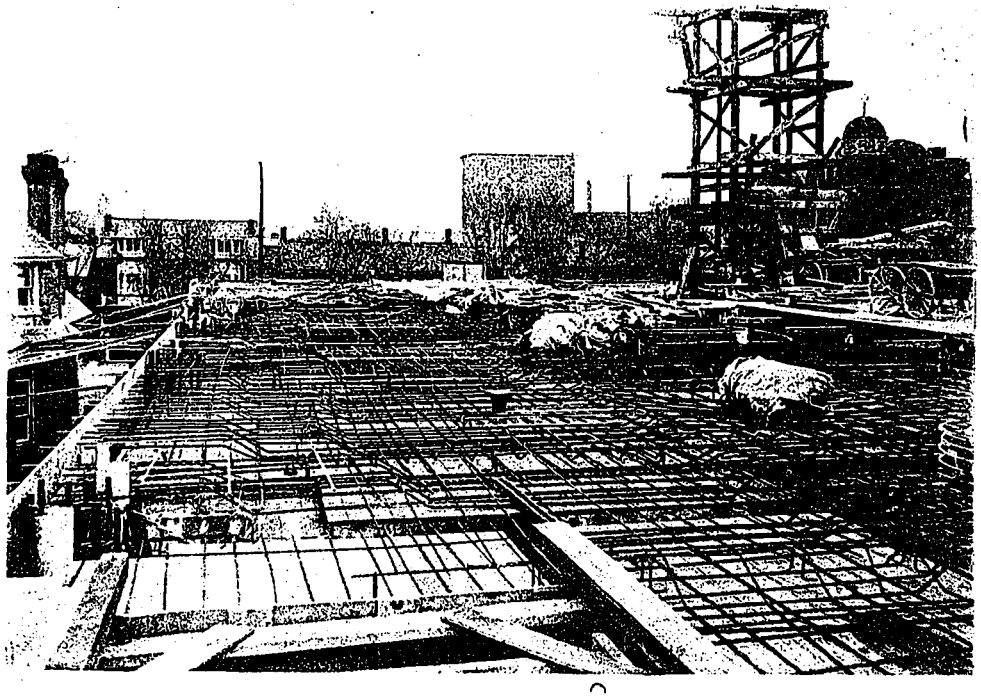
pressor rooms, as well as a lavatory for the male employees. The top floor of the building will be used as a machine shop.

The gasoline supply is stored in two five-hundred-gallon tanks situated between the building and the sidewalk on Simcoe street. The gasoline pump is situated just within the door, and is arranged so that gasoline may be drawn from either tank and discharged through hose either to a car outside or inside the building. The four oil pumps stand along the west wall north of the entrance. and draw oil from four fifty-gallon tanks in the oil storage room below. The compressed air equipment consists of two and one-half inch by three inch water cooled pump, with a capacity of from six to eight cubic feet per minute, operated by a three horsepower direct connected motor discharging into a thirty-six inch by eight inch tank. The pump starts automatically when the pressure in the tank drops to one hundred pounds per square inch, and stops when the pressure reaches one hundred and forty pounds. An air pipe leads up through the building with an outlet connection on each floor. This equipment also supplies air for tires, with one outside and one inside air hose connection. These tires are each fitted with a small air chamber, to one end of which the hose connection is made, and to the other end of which a pressure gauge is attached, so that the pressure of air being supplied to the tire can be seen directly on the gauge.

The elevator is perhaps the largest in Canada. It is ten feet wide by thirty feet long, and is designed to lift 10,000 pounds. It is fitted with the counterbalanced type of doors, mechanically operated and arranged so that a door cannot be opened at any floor except when the car is at that floor, and the car cannot leave the floor until the door is closed.

The building was designed by Harkness & Oxley, consulting engineers, and constructed under their supervision. Shepard & Calvin were consulting architects, and H. H. Angus electrical engineer.

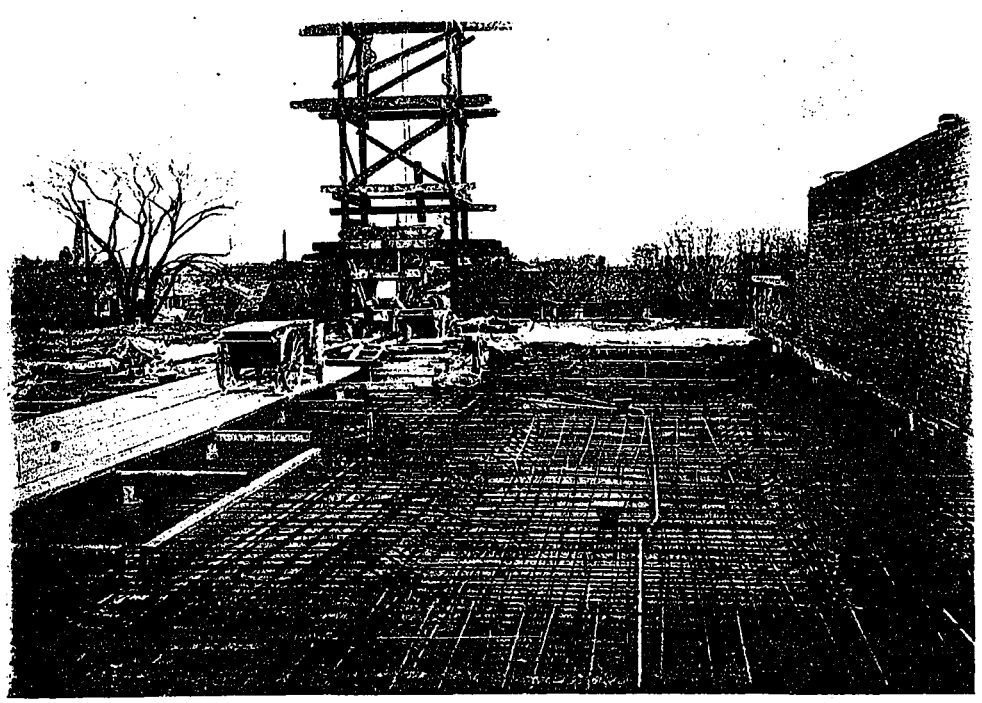
Separate contracts were let for the different trades.



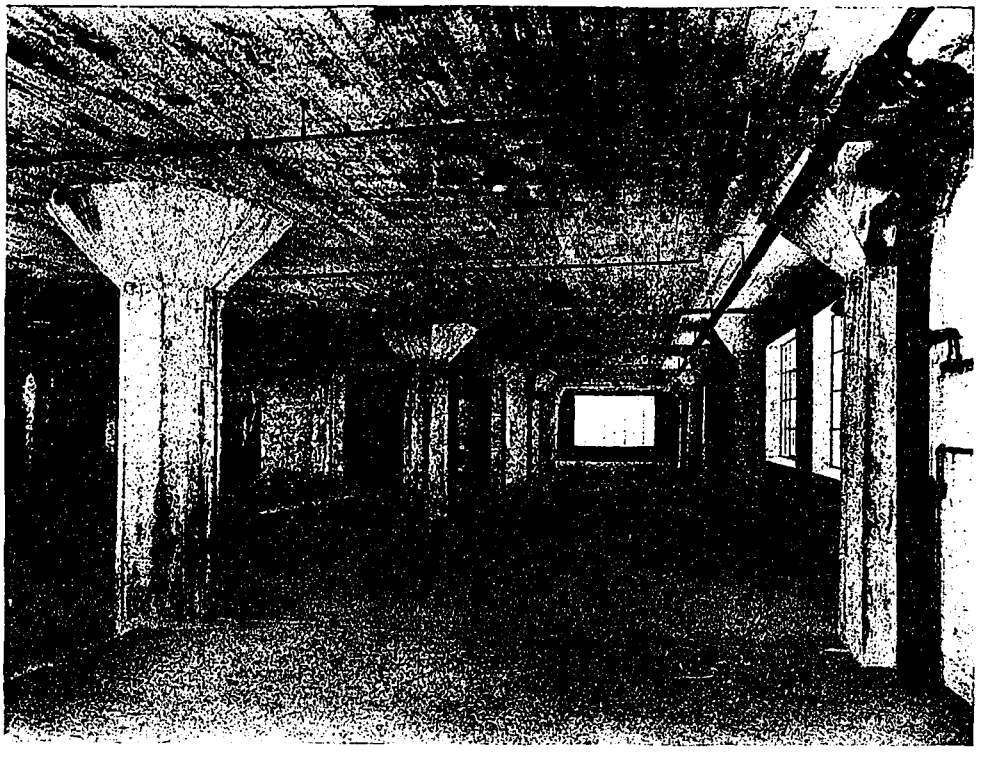
REINFORCING IN PLACE, TO RECEIVE CONCRETE.

A New Pulp and Paper Mill in Manitoba

A pulp and paper mill, having a daily capacity of one hundred tons of paper, and employing about five hundred workmen, is being built at Grand Rapids, Manitoba, about two hundred and fifty miles northwest of Winnipeg. The

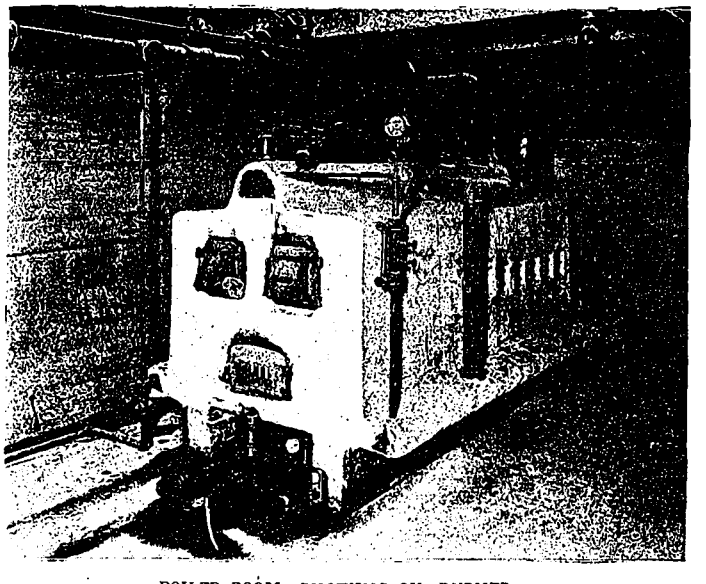


REINFORCING IN PLACE TO RECEIVE CONCRETE, LOOKING WEST.

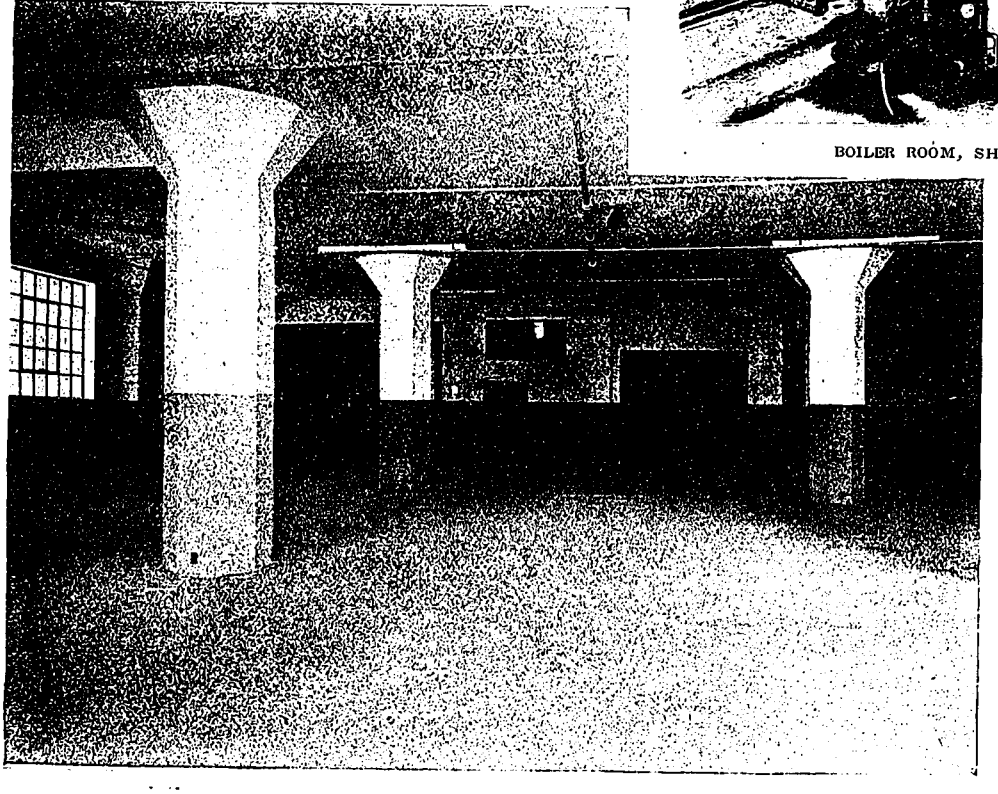


VIEW OF TYPICAL FLOOR BEFORE FINISHING.

controlling interest is held by Winnipeg business men, who are holders of extensive timber lands in the vicinity of Grand Rapids, and anticipate the construction of a large sawmill in connection with the pulp and paper industry. The head office of the company will be located in Winnipeg, and the product of the mills shipped by water to Winnipeg. The work of construction will be begun in the early spring, but the completion of the plant will probably extend over a period of nearly two years.



BOILER ROOM, SHOWING OIL BURNER.



VIEW, TYPICAL FLOOR.

The Lumbering Industry of The Prairie Provinces

Although the prairie provinces are usually associated with but one pursuit, namely, farming, the forested portions give rise to a lumbering industry of importance, and, while inferior in development to those of British Columbia or the eastern provinces, are of great value to the immigrant settlement in the west. In 1913 some 188 mills in Manitoba, Saskatchewan and Alberta sawed approximately 250 million feet of lumber, valued at the point of manufacture at over $4,260,000. Of this quantity, Saskatchewan forests produced approximately two-thirds, Alberta one-fifth, and Manitoba the balance. The prairie market consumed about 1,434 million feet of lumber annually. Over one-half of this comes from British Columbia (in part from the Railway Belt portion), and the remainder is supplied from north-western Ontario, the United States, and the home forests.—*Forest Protection in Canada*, 1913-1914.

Two Worthy Greenhouse-Garage Problems

WHEN your editor first asked me to write this article I shook my head. Shook it, because having so much to do with the actual construction side of greenhouses, was afraid it would just naturally influence me to put too much stress on that side. But last week, after having had two rather "tusseling times" with two of your profession, am now welcoming this opportunity.

Am going to tell you exactly what our points of difference were, thinking they might be of special interest to you in any greenhouse work you may have in hand.

In the case of number one the garage was still on paper.

The location conditions, or even the fancies of the owner, did not proscribe that the point of greenhouse attachment should be on the eastern eave's side, where the roof snow and ice would tumble on the greenhouse and break the glass; not to mention perhaps, freezing the plants before repairs could be made.

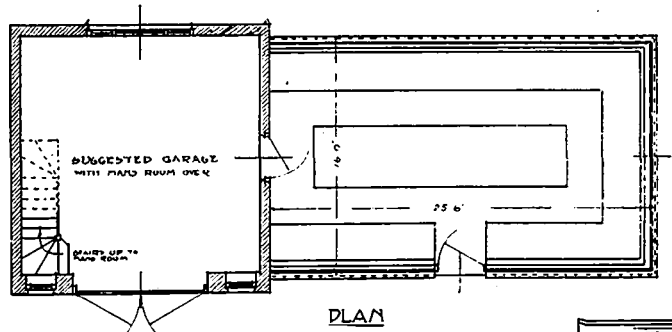
There was the available southern side—an ideal exposure—but the plan called for the side entrance of the greenhouse being the termination of a certain walk, which, if not so carried out, would "spoil the balance," or "the axis," or something.

Of course, the roof could be protected with a snow screen guard; but why spoil the graceful lines of its roof by making it look like some kind of a huge trap—an unsightly thing the year about? Not only unsightly, but a beautiful thing to form a shade blanket, shutting out the light at the time of all times of the year when plants most need all possible light and sunshine.

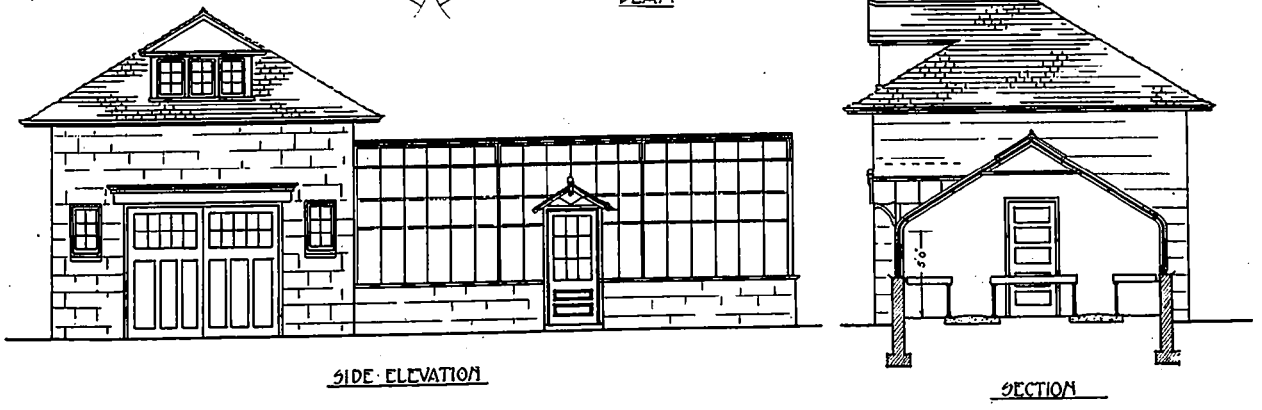
It is, however, going to be built just as originally planned, and so it is that practicalness is being sacrificed to "axis."

Instance number two had to do with the heating.

GARAGE AND GREENHOUSE, ERECTED FOR MRS. J. E. GORDON, WALLACEBURG, ONT., BY LORD & BURNHAM CO., LTD.



PLAN



SIDE ELEVATION

SECTION

In this case the garage was already erected, but the heating contract not yet let.

The greenhouse was an after-thought, and its location was right in every particular.

But the architect insisted on steam heat, in spite of the fact that we pointed out that in its fierce heat flowers did not thrive as with the equableness of hot water.

He claimed that if steam was good for the big rose houses fifty feet wide and hundreds of feet long, it was good for the one twenty-five by fifty feet.

He refused to see that in those big houses there is such a large mass of air above the plants that because of better ventilating conditions, it takes the "fierceness" out of the heat.

He refused to recognize that although steam is quicker to respond, it also cools down more quickly. It has none of the latent heat of hot water to act as a fortifying factor against sudden outside changes.

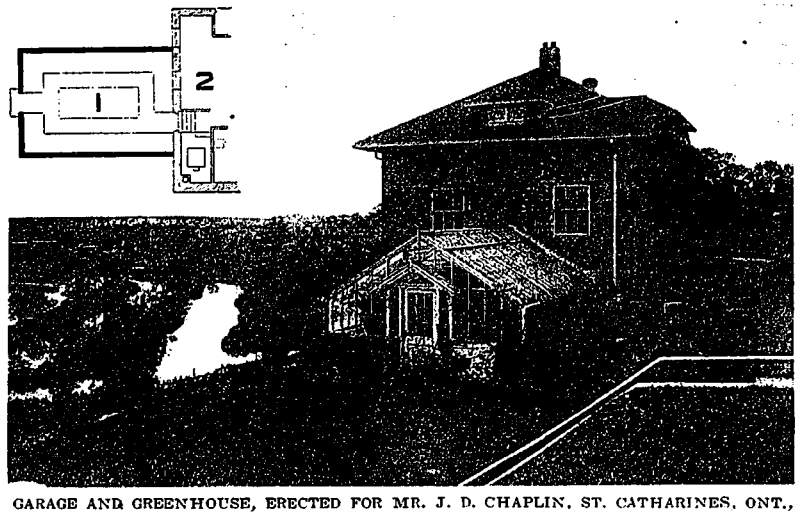
Were the specifications changed to hot water?

No.

Both garage and greenhouse will be steam heated.

As near as I can make out the architect and the manufacturer need to get a good bit closer. Both, maybe, are taking themselves a bit too seriously.

The manufacturer may be putting too much emphasis on the practical. The architect too much on "axis." Why not a ground somewhere between each, to the ultimate greater advantage of each, and the broader, more sincere service to the client?



GARAGE AND GREENHOUSE, ERECTED FOR MR. J. D. CHAPLIN, ST. CATHARINES, ONT., BY LORD & BURNHAM CO., LTD. BECAUSE OF ITS COMPACTNESS AND ECONOMY IT PROVES A GOOD COMBINATION. HEATING OF BOTH IS ACCOMPLISHED BY THE USE OF ONE BOILER, SITUATED UNDER THE GREENHOUSE.

French Supplies of Reconstruction Materials

The French Minister of the Interior has just published the results of an investigation made under his direction concerning the supplies of building materials likely to be available for reconstruction work in France upon the conclusion of peace. Among the materials thought to be available in sufficient quantities are stone, brick, sand, cement, tile, building hardware, wallpaper, and certain others of minor importance. It is believed that for lime, iron pipe, street-paving materials, and sandstone French production may be increased to a point that will meet the demands. In the groups of materials in which a shortage may be felt are plaster, timber and lumber, slate, structural iron and steel, heavy hardware, tin, zinc, lead, plumbing supplies, pumps, sanitary appliances, heating apparatus, paint, and glass of all sorts.

It is reported by the Government that the necessary steps will be taken promptly to encourage the larger production of those materials of which there will undoubtedly be a very considerable need as soon as building operations are resumed on a large scale. These measures consist mainly of: The provision of facilities for obtaining the necessary equipment for producing building material; the resumption of operations in plants that were shut down; the resumption of the exploitation of mines and quarries; the reopening and improved equipment of brickyards, tile works, and establishments engaged in the manufacture of lime and cement and other basic building materials; finally the adoption of measures to increase the supply of labor. It is, furthermore, stated by the Government that every effort will be made to have the work of reconstruction undertaken as far as possible by local concerns. It is, of course, generally understood that the Government will give financial assistance to all manner of reconstruction work in the devastated regions of France.

English Architects Donate Old Tracings for Surgical Bandages

In a recent issue of "Building News," of London, it is pointed out to draftsmen that one of the many minor ways to help in these times of war is in the collection of old linen tracings.

The article states: The cloth, when boiled, washed and sterilized, makes excellent bandages, pillow cases, etc., for the wounded—things that are still bady needed. Engineers need have no fear that their designs will be copied, because all the tracings are handed to a responsible person to be treated. There are few works that do not destroy dozens of yards of tracing linen a year, and now that this excellent use for the waste material is pointed out to them we feel sure they will respond.

A Three Car Garage, Toronto, Ont.

THE outstanding feature of this garage is the brightness of the interior, the inside walls being lined with white enamelled brick and the ceilings sheeted with Georgia pine. The floors are of slab concrete construction laid on a cinder bed three inches thick, and have a slight grade to trap in centre of floor. The washroom floor has a grade to edge of wash rack, and then a three-quarter inch fall to trap in centre of rack. The heating apparatus is a hot water system, which maintains a temperature of seventy degrees if necessary at zero weather. The oil and gasoline storage equipment is modern, the pumps being situated in the washroom, and are easily accessible near the entrance. Three sets of swing doors provide entrance to each car rack, and are so situated as not to interfere if all should be opened at once. At the rear of car space is located a washroom with shower attachment; also the workroom and tool storeroom.

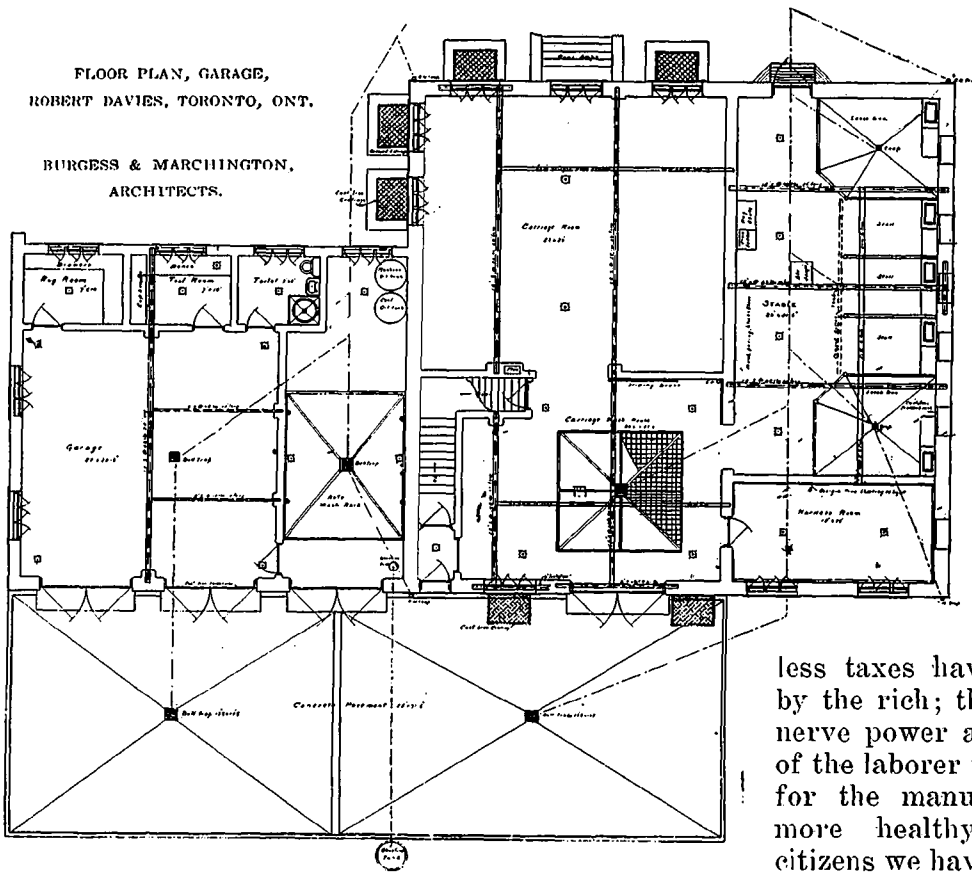
GARAGE, ROBERT DAVIES, TORONTO, ONT. BURGESS & MARCHINGTON, ARCHITECTS.

Housing Conditions in Canada

Surely the poorest and meanest citizens of any country are entitled to decent and sanitary shelter. This should not be withheld from them because of misfortune or inefficiency. Neglect of the conditions in which many people have to live is often excused on the ground that they themselves are responsible, even though it is not them, but their children, whose health and moral upbringing is of such value to their country, who are the chief sufferers from the neglect. But these excuses are most frequently offered by those who profit from existing bad conditions, and whose minds have become warped by that fact. People soon become degraded by bad conditions, and it is easy to point the finger of scorn at them and say they are responsible for their surroundings. After we have permitted them to become degraded, after we have allowed dwellings to be erected in which their sense of decency cannot be kept, we organize educational campaigns and preach at them and expect them to respond. At great cost we provide schools for their children, thinking that we can properly train young minds in bodies diseased and stunted by lack of air and

VIEW OF CAR SPACE, SHOWING ENAMELED WALLS AND BEAMED CEILING.

clean surroundings. At further expenditure we provide hospitals and asylums, to correct mischief, much of which might have been prevented by proper building by-laws. Our factories and workshops want, meanwhile, efficient and mentally alert men, and the country loses in the sum of its physical strength, intelligence and spiritual force.

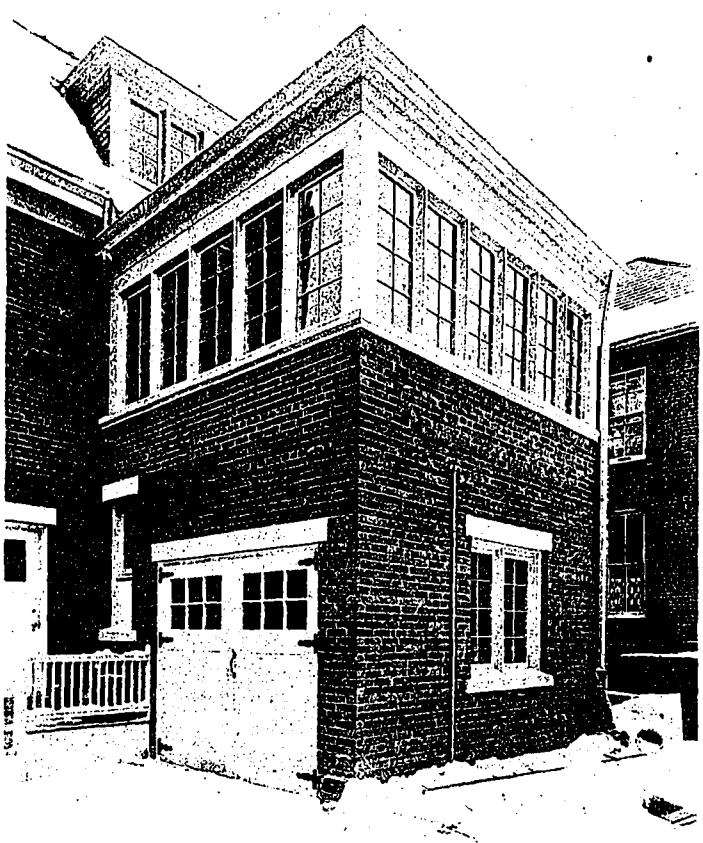


FLOOR PLAN, GARAGE,
ROBERT DAVIES, TORONTO, ONT.

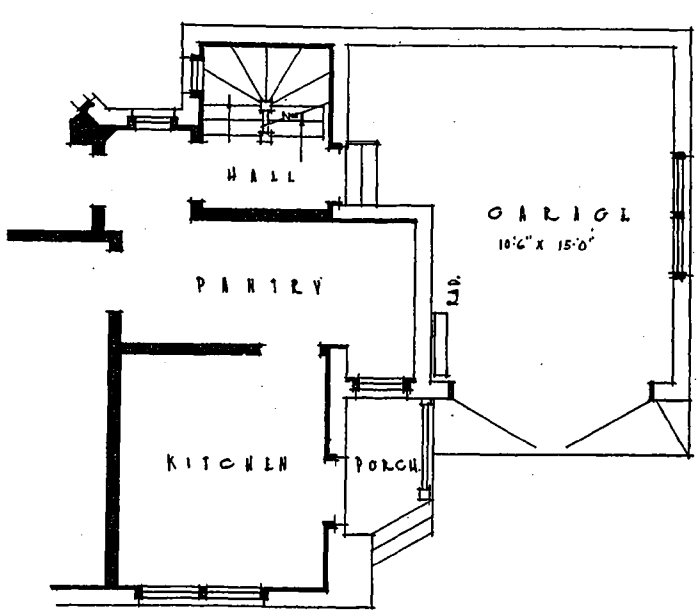
BURGESS & MARCHINGTON,
ARCHITECTS.

Why is it all necessary? The better buildings we erect the better it is for the builders; the more land we occupy with homes and gardens the better it is for the real estate owners; the less danger of fire the better it is for the insurers; the higher the standard of living of the poor the less taxes have to be paid by the rich; the greater the nerve power and endurance of the laborer the better it is for the manufacturer; the more healthy and clean citizens we have the better it is for the country. Let us build for the future, passing up the errors of the past.

A Desirable Garage Design, Toronto, Ont.



AN economical design, affording ample facilities to the owner who cares for his own car. Dimensions sufficient for a car of any size. Easy access to house is provided, and yet distinctly a separate structure. The upper storey provides a sun room and adds to the exterior appearance.



GARAGE, TORONTO, ONT. HYNES, FELDMAN & WATSON, ARCHITECTS.

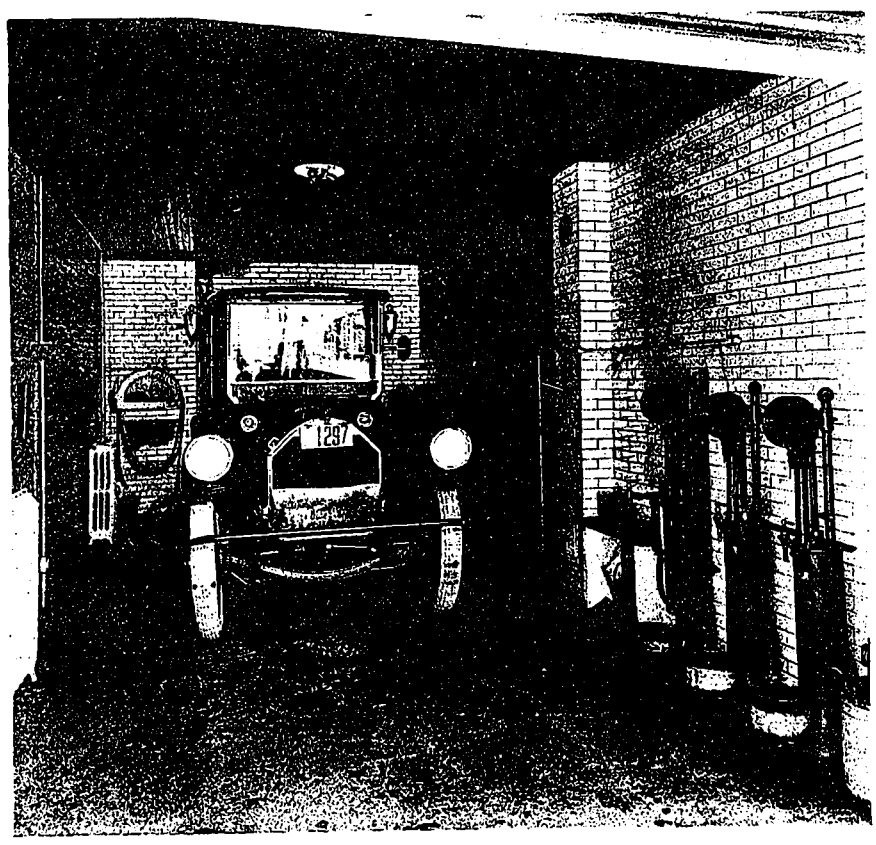
Garage on St. George Street, Toronto, Ont.

COMPLETE equipment and utilization of overhead space are features of this garage. Space for six cars has been provided. Entrance from the street is obtained by a concrete roadway leading into a paved court, which affords ample room for turning. The building is of red pressed brick, and the car space and wash room are lined throughout with white enameled brick. A glass garden extending from the southern end of the garage provides entrance to the house. Access to the rug room, workroom and storeroom is had from the main car room. The upper storey is equipped as a billiard room, an inglenook with fireplace helping to provide a cheery atmosphere. The servants' quarters are also on this floor. The building is heated by steam from the plant located in the basement.

GARAGE, GEO. H. GOODERHAM, TORONTO, ONT. GEO. W. GOUINLOCK, ARCHITECT.

The Treatment of Sewage

The necessity for proper treatment and disposal of sewage cannot be too strongly emphasized in Canada. Many municipalities have been very active along these lines, but unfortunately a greater percentage have been extremely negligent. The result of this, as shown in a report on "Water Works and Sewerage Systems in Canada," recently issued by the Commission of Conservation, is that more than sixty of our inland water systems are at present receiving raw sewage, one hundred and eighty municipalities contributing to this very undesirable condition. The practice of treating sewage is being recognized as imperative throughout the civilized world, and would possibly spread more rapidly throughout Canada were some of its economic aspects better known. Recent experiments have been made in this connection to determine the feasibility of a new process to extract grease and fertilizer base from sewage.



WASHROOM, OIL AND GASOLINE PUMP.

Ordinary sewage sludge from settling basins is greasy, offensive and of so little practical value that farmers will not accept it for fertilizer, even as a gift; yet this sludge contains valuable fertilizing elements and considerable grease. The settling of the sludge and the extraction of the grease is facilitated by the addition of certain chemicals, and the process is found to possess the following advantages:

1. The chemical treatment practically pays for itself by the sale of grease and fertilizer recovered.

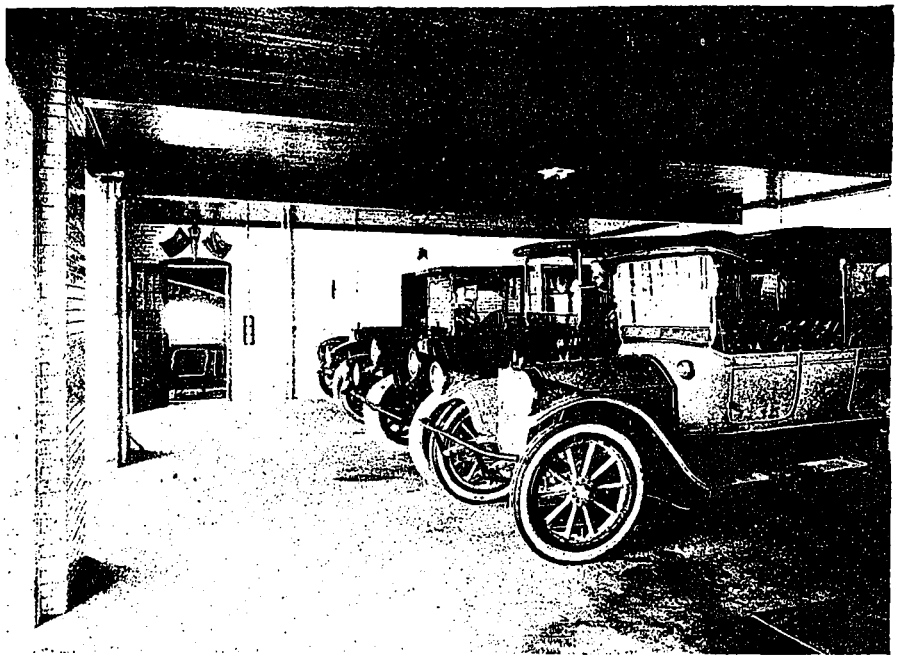
2. The sewage is disinfected.

3. The chemical acts as a strong deodorizer and prevents the nuisance of treatment works.

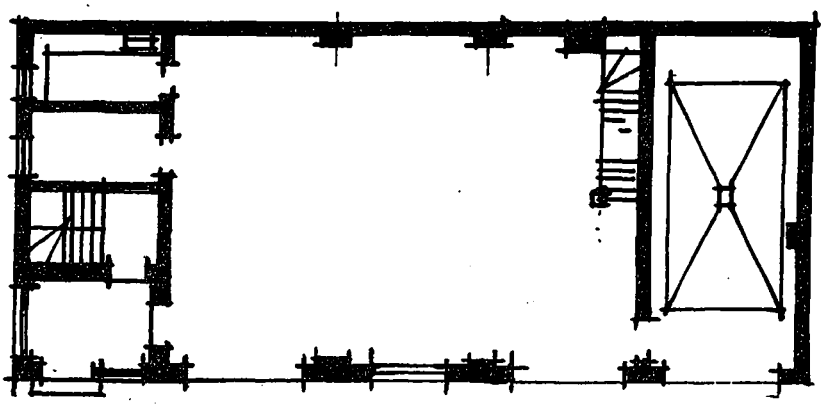
4. The fly nuisance is also avoided for the same reason. The process has been thoroughly investigated and tested, with results that seem to indicate that it will not only be successful, but profitable.

Architectural Training

Scholastic training in architecture is a comparatively modern idea. With our present widespread facilities for college training in the arts and sciences it is difficult for us to keep in mind that the architectural school is essentially a creation of the past century, and that no such facilities for study were accessible to ancient architects or those of Renaissance days. The great centres of continental Europe in the days of the Renaissance, Paris, Padua and Salamanca, with their splendid universities dating back to mediæval times, says the "American Architect," had no place for the architectural student, and the traditions of architecture were transmitted from master to pupil by personal association. In those days it scarcely merited the name of profession in the same sense as did the law or medicine, nor was it considered worthy of being studied in similar institutions.



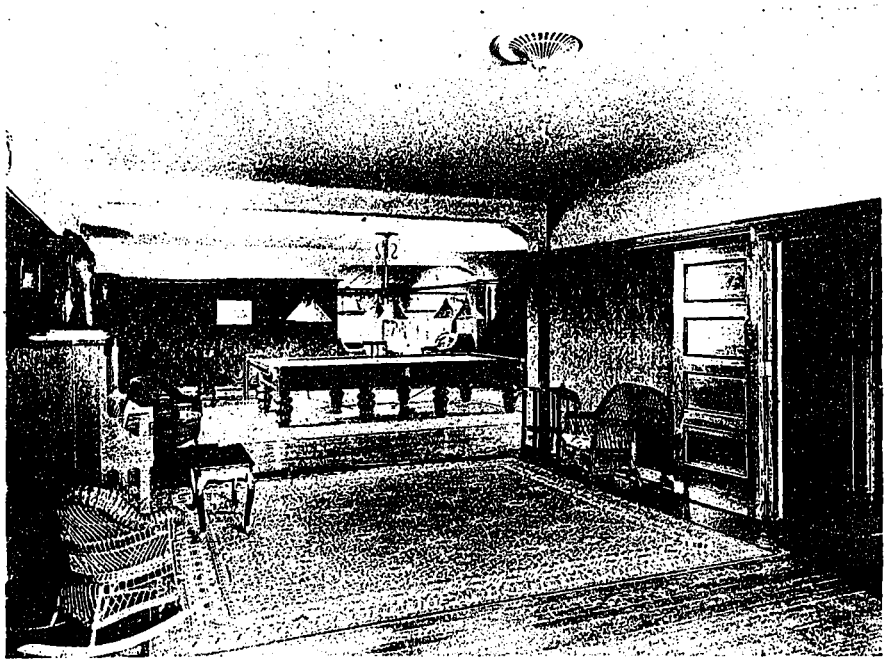
MAIN CAR ROOM.



GROUND PLAN, GARAGE, GEO. H. GOODERHAM. GEO. W. GOUINLOCK, ARCHITECT.

Our present systems of collegiate training in the profession of architecture are based upon the idea of forming the young and undeveloped mind along broad and sane lines. Cultural courses and supplementary studies form quite as important a part of the work as the study of pure design, and the work of our modern architects is characterized by a sophistication that can be directly traced to the broadening influences of the college.

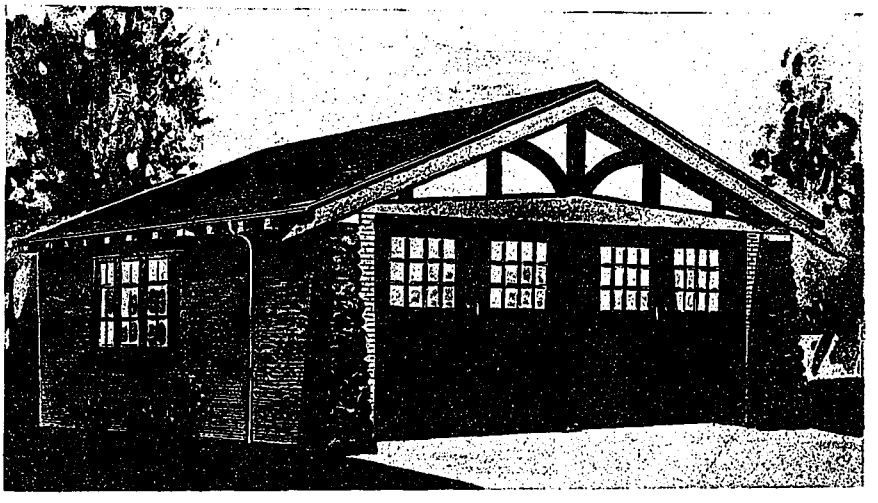
It may be questioned, however, whether or not in this system of education the attention paid to breadth of view does not sacrifice that high sincerity in architecture which is, after all, necessary for the production of really great works of art. There is in the busy classes of a modern architectural school little of the close personal relationship between master and pupil that developed the great architects of the Renaissance—a relationship that must have fostered and transmittted from one generation to the next the idealism of architecture. The type of architect to whom the production of sincere and beautiful buildings is of supreme importance and the economic profit a mere incident is unfortunately greatly in the minority in America. We are, as a class, too prone to accept the practical limitations put upon our art and to erect buildings that are compromises at best, rather than structures that represent our utmost of artistic ability.



BILLIARD ROOM OVER GARAGE.

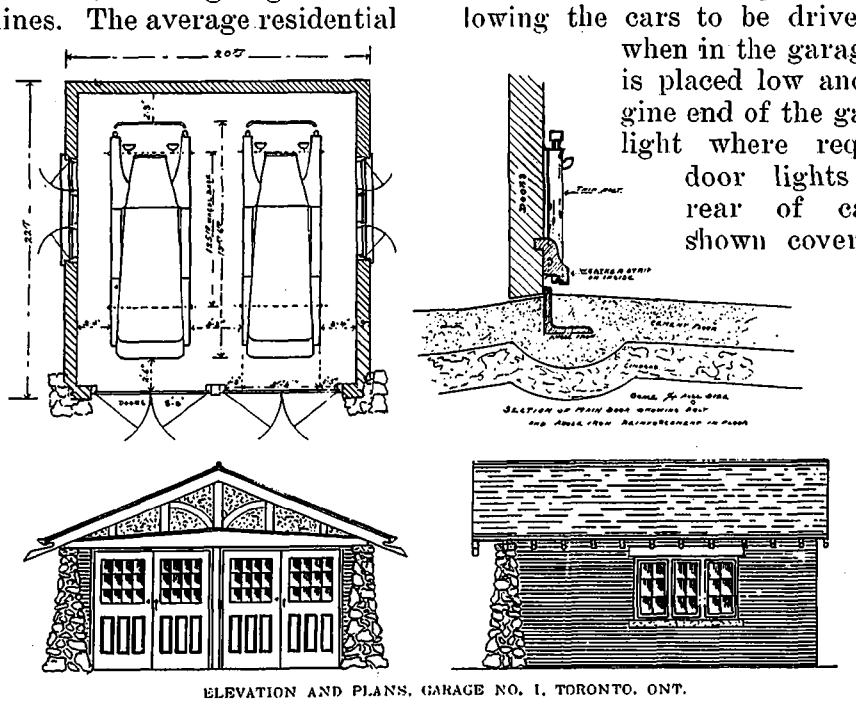
Residential Garages at Toronto, Ont.

THERE are many points to consider in the design and construction of small motor garages, and this type of building is probably the most important of any of the outbuildings erected in connection with ordinary domestic usage. The demand for garages has increased proportionately with the increase of motor car owners. A house can be immeasurably improved by the addition of a garage correct in architectural design, and also from the standpoint of safety. In spite of the latter fact, however, it will often be found that an expensive car is housed in a cheap and unsuitable building, and in many cases this is due to the lack of foresight and experience on the part of the owner, rather than to any deliberate attempt to save a few dollars to the detriment of the building itself. If the obvious advantage of a suitable structure which need not necessarily be expensive, were clearly set down before the average motor car owner, it is quite certain he would not be prepared to run the risks of a combustible or temporary building, and the result would be that garages would be built on better lines. The average residential garage is but a small building, and the amount involved is very often out of proportion to the remuneration, and if sufficient interest is not shown, naturally the garage suffers. In view of this, contractors specializing in garage construction are offering their services to architects. The problems which arise are frequently greater than appear at first sight. The main door troubles are numerous; and in heating, while the modern adaptation of electricity, gas and hot water are making each more feasible, yet there is considerable to consider in each. The chief points in connection with every garage may be stated as follows: (1) Site; (2) dimensions; (3) materials of construction and finishing; (4) storage of oils and gasoline; (5) lighting and heating (6) ventilation. The accompanying examples located in Toronto show to an extent the progress made in residential garage construction.

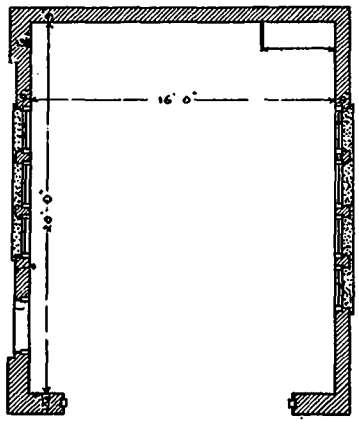


GARAGE NO. 1, TORONTO, ONT.

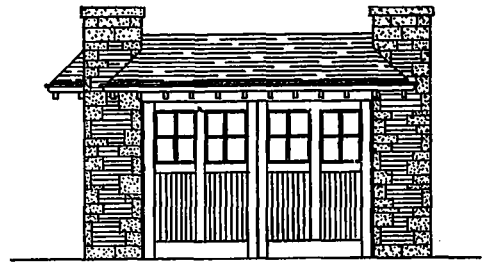
Garage No. 1 shows a Hurndall garage of cobblestone and brick combination, twenty by twenty-two feet outside, with plan for two cars standing in position after entering garage, giving surrounding measurements with front bumper and cover down, car base being taken at one hundred and twenty-five inches, the maximum for comfort in this size garage. The clear door space is seven feet ten inches, and it will be noted that a wood post is substituted between the doors in place of a brick pier, allowing the cars to be driven closer together when in the garage. The side light is placed low and towards the engine end of the garage, giving most light where required, the front door lights taking care of rear of car. The section shown covers the main door construction at the floor, the novelty of this being the weather strip on inside of the doors, the metal reinforcement in the floor forms serving to shut against, but difficulty has arisen, due to sweating on inside.



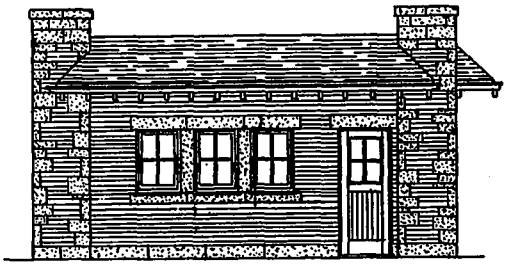
ELEVATION AND PLANS, GARAGE NO. 1, TORONTO, ONT.



PLAN



FRONT



SIDE

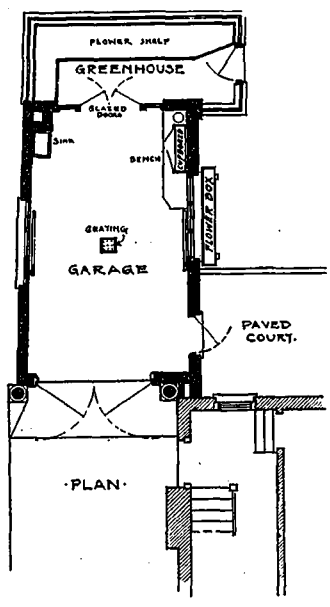
GARAGE NO. II, TORONTO, ONT.

which in winter will freeze. This is eliminated thereby.

Garage No. 2.—This is a combination of brick and stone, the feature of this design being width of front doors, with a view to accommodating one's friend who calls, or owner's second car, in close quarters. It will be found by running the first car to enter, forward on left side, there is ample room to drive a second car in on the right.

Garage No. 3.—In this plan the glass garden is situated at the rear of the garage. The garage is linked up with the house at right front corner; the pergoda at rear of house is continued round the garage, and side entrance from rear of house is provided. The individual hot water system is contained in basement under conservatory, which heats the same, and also provides hot water in garage for washing purposes. Underground conduits from house carry water and light mains to the garage.

Garage No. 4.—The exterior of this garage has been constructed entirely of grey stone, the interior being veneered with brick. While typically a two-car garage, it has been furnished with three sets of swinging doors, and has space enough to comfortably house three cars. The cement floor has been provided with traps for drainage, and the ceiling has trap doors, through which the car tops may be hoisted when necessary. The roof is of peculiar design, owing to a desire being expressed to protect the trees on each side of the building.



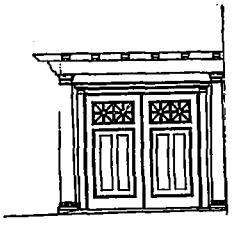
PLAN

Metric System and Exchange in Different Countries

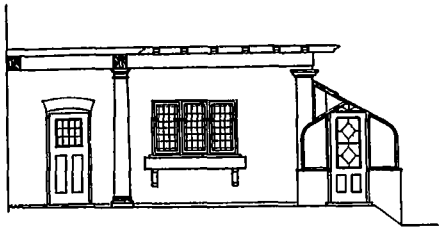
By Emile E. Delay, E.D.P., Architecte Diploma Par le Gouvernement Francais.

In order to bring about a solution of one of the great problems which will arise after the war between the Allies, who will want to have industrial and commercial relations with a basis at once normal, simple and uniform, facilitating the exchanges and transactions, it will be an imperative necessity to regulate the unity of exchange in order to avoid the present complications arising out of the systems in vogue relative to weights and measures and currency values, which in some certain cases are a source of grievous difficulty, and hinder progress. Progress doubtless is hindered by the fact of involuntary errors which the present systems are impotent to avoid; these errors occasion the loss of time, energy and money, also occasion oftentimes legal complications followed by mutual fault-finding, and all this without any profit to the interested parties. And why? Because there is no one possessing sufficiently robust initiative to cut the Gordian knot, to break ancient customs which have served their purpose, but which have become obsolete relative to the modifications which progress has brought about in this immense arena of international, commercial and industrial exchange.

For years we have co-ordinated on the postal, telegraphic and telephonic exchanges in international transportation. We have unified and systematized wherever necessity compelled us, and this, I must say, for the greater good



FRONT ELEVATION



WEST ELEVATION

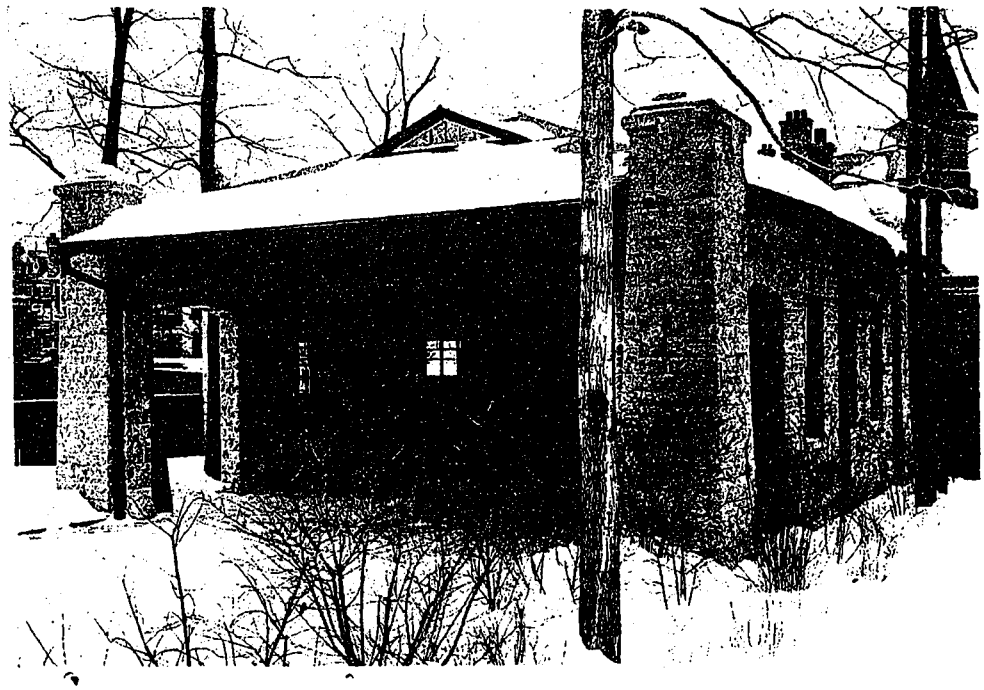
GARAGE AT 69 ROXBOROUGH DRIVE

DURKE, HORWOOD & WHITE, ARCHITECTS

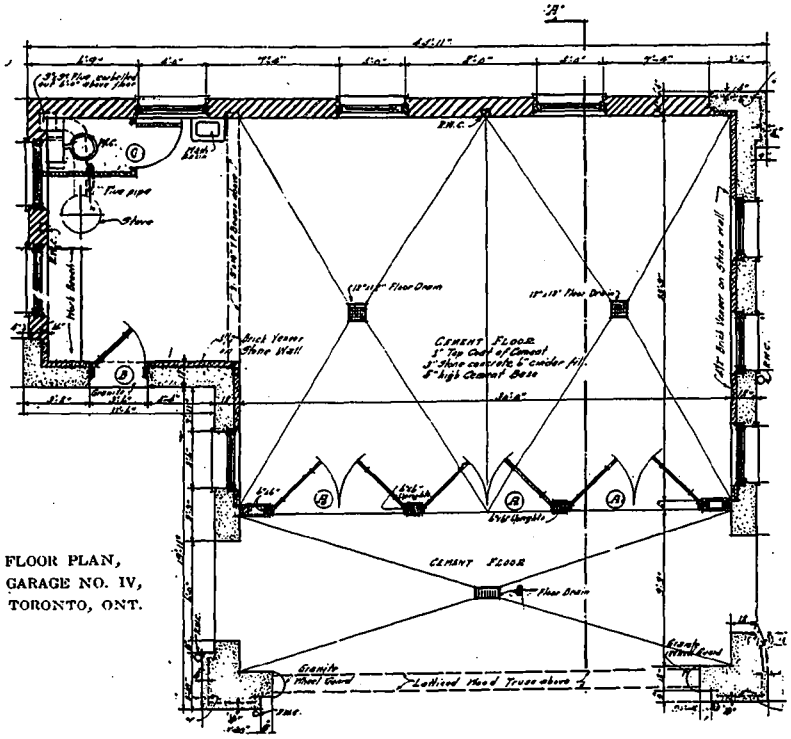
GARAGE NO. III, TORONTO, ONT.

of the world at large, whilst we have been insensible of the advantages that the metric system could afford, especially amongst the producing countries, among which England and her colonies stand out pre-eminently.

It must be admitted, and this without fear of contradiction, that the march of progress during the last quarter of a century has made giant strides, bringing with it a multitude of necessities not thought of before, but which have all turned out to be very satisfactory; and here it appears to me almost incomprehensible that this question of weights and measures and values has remained stationary, whilst others, not half so important, have been assimilated. There is then an inexplicable phenomenon, and so at the outset it is with a sincere conviction that my efforts will not be limited to mere theatrical effect, but that they will result in some practical system of understanding regarding this question, that I make these suggestions to bring about a practical solution. This can be accomplished later through the educational effects in practice of the very acts of public life in England and her colonies, which will have a part, I hope, after demonstrating to the world what they are capable of in the military domain, that they are not behind in adapting and assimilating progress, especially where their Allies and international friends are concerned, and where the greater prosperity of economic industrial and commercial exchange is concerned. In the vast realms comprised within the British Empire, I have often heard some stupid people taking a particular pleasure in lengthy conversations without foundation and reason that "everything was for the best in the best of all possible worlds." Also, as stated in my article appearing in "The Leader" under date of September 30th, it is not to these people nor to the arresters of progress that I am addressing myself, but more to those people who feel the necessity of avoiding shoals and reefs which are already very numerous in the matter of international exchange.



GARAGE NO. IV, TORONTO, ONT.



FLOOR PLAN, GARAGE NO. IV, TORONTO, ONT.

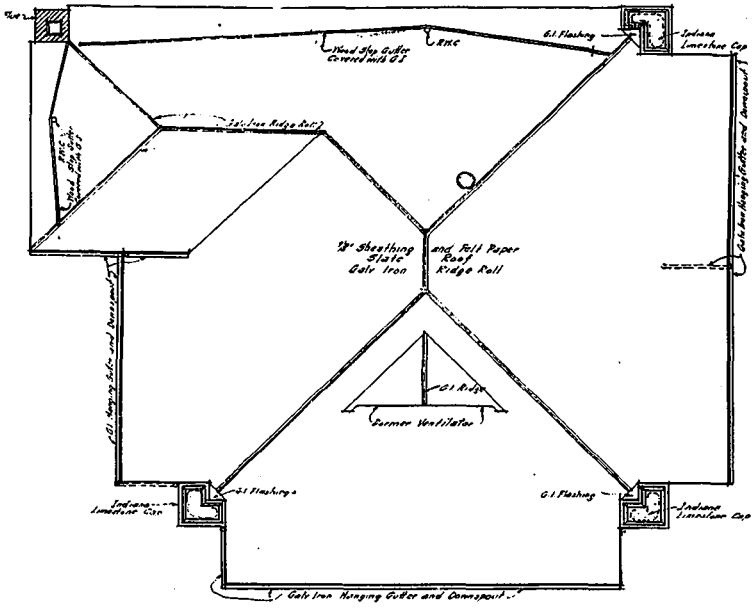
The metre is the unit of measure which appears to be most rational, as a fundamental unit. It is equal to the ten-millionth part of the quarter of the terrestrial meridian, or 0' .39400". Before the establishment of the metric system in France, there existed no uniformity in the different weights and measures in common vogue. This state of things presented grave inconvenience. Bordering districts were commercially isolated. In 1790 a decree of the Assembly charged the Academy of Science to organize a better national system. It was necessary to determine a unit of measure which would be basic for all others, and that this unit for the future would be basic and unalterable. It was decided to take it from nature itself. The academicians Mechain and Delambre were accordingly chosen to measure the length of the quarter of the terrestrial meridian, the

ten-millionth part of this length was taken as the unit of measure and received the name of metre.

The establishment of this system was one of the most useful aids to humanity. Switzerland, Italy, Belgium, and Spain, etc., adopted it, and to me it seems indispensable that England and her colonies must follow this example if they do not wish to expose themselves to commercial and industrial isolation.

To measure distances, we have the metre, which is divided into one hundred centimetres. The centimetre, which is divided into ten millimetres. We must then have one thousand millimetres or one hundred centimetres to make one metre. Ten metres are called decametre. One hundred metres are called hectometres. One thousand metres are called one kilometre. Ten thousand metres are called a myriametre. The measure of distance is expressed by placing the figure 1 or the letter L (linear), as, for instance, 100^{L}.

To measure agricultural surfaces, we have the centiare. The one hundredth part of the are, which is equal to one metre square. The are is a decimetre squared, or one hundred square metres. The hectare or the hectometre squared, or one hundred ares. The surfaces in metres are expressed by placing the figure 2 to the side, as, for example, 100 M^{2}, because the square takes two measurements.



GARAGE NO. IV, TORONTO, ONT. ROOF PLAN

In measuring cubes, we have the cubic metre, a solid body with six equal surfaces one metre in length each, the cube equals one million centimetres cubed or one thousand decimetres cubed. The cubic units are expressed in cubic metres such as 1^{3}, 100^{3}, $1{,}000^{3}$ cubic metres, because the cube takes three measurements. As regards the unity for capacity, we have the litre, which contains one cubic decimetre, the litre is divided into ten decilitres, one hundred centilitres, one thousand millilitres. Ten litres are called a decalitre, one hundred litres a hectolitre. Larger quantities are expressed as one hectolitre, ten hectolitres, or one kilolitre, and after we tell twenty, fifty, one hundred, one thousand, ten thousand hectolitres.

A litre of distilled water at five degrees centigrade weighs one kilogram. For the weights, we have the kilogram, which is subdivided into one thousand grams. Ten grams are called a decagram. The one hundredth part of a gram is called a centigram, the one thousandth part of a gram is called a milligram. One hundred grams are called a hectogram. The quantities larger than a kilogram are expressed as follows: one hundred kilograms are called a metric quintal, one thousand kilograms a metric ton or tonneau.

To measure the temperature we have a thermometer called centigrade, which, when at zero, indicates the moment when water freezes.

To express monetary value, we have the following coins: a centime and two centimes in copper; five, ten, twenty, twenty-five centimes in nickel; fifty centimes, one franc, two francs in silver; five francs in silver or gold; ten, twenty, fifty, and one hundred francs in gold.

The teaching of the metric system in the schools should begin immediately, and should be made obligatory by a law promulgated by the respective governments. This law would determine when the present system would be superseded by the metric system. I believe that two years would be sufficient to give the people a familiar knowledge of the metric systems, and to bring it into vogue in the manners and customs of the various countries. This, then, indicates that there is no time to lose, and those who have the moral and official responsibility at heart should at once set to work in a way that will bring about this necessary victory without *eclat*, but rather to bring it about unostentatiously in this great Empire which has always been valiant and full of effort, and which does not know what it is to take second place when progress is questioned.

In the schools, demonstrations could be made through pictures, designs and drawings, and by written explanations, and by all these details the metric system and its correlatives, weights, measures and fiduciary system, could be popularized.

This modest effort has no other end in view than to initiate an activity in favor of the adoption of the metric system, which would have the advantages of facilitating and augmenting exchanges for the greater good of all.

The Garage Door Problem

ONE of the troublesome problems that has arisen since the advent of the automobile garage is that of providing doors that will not be a constant source of annoyance in their operation. Swing doors, hung on the ordinary hinges, are entirely out of the question, as with the width usually required they take up too much room, and are subject to too great a strain in opening and closing. They will blow open or shut just at the wrong time, and the action of a strong wind will keep the garage men constantly irritated. Sliding doors are usually effective, but frequently lack of room prohibits their use. There is also the danger of annoyance caused by constant rattling, all of which leads to the point that in deciding such a matter the architect is best advised when he decides to secure expert advice on the subject. Herewith are shown illustrations of various types of doors which will meet conditions in any building. Figure 1

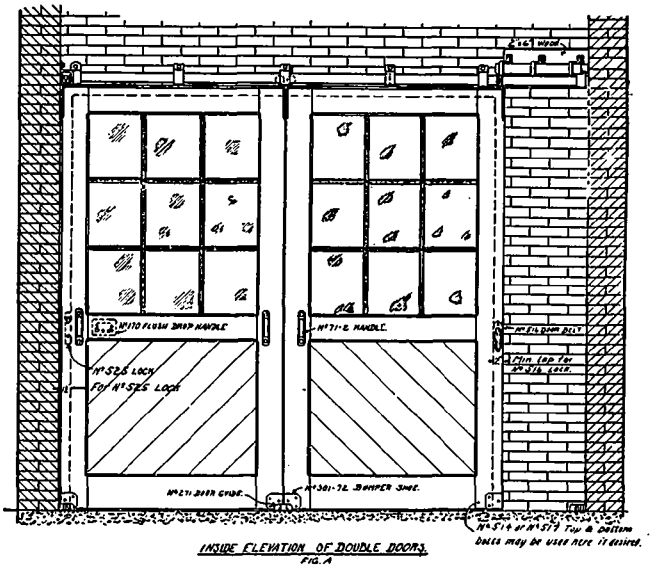


FIGURE I.

illustrates a two-door arrangement where the doors slide right and left. Figure 2 shows the floor plan of the angle type single door, of the ordinary type. This also shows the elevation of double doors showing hangers, and the manner in which the track is carried across the corner if there is considerable space between the edge of the door and the side wall.

The side run of track is placed just above the front run of track, and a slot is cut in the lower track for the pendant of one of the hangers, as shown in Figure 3. If desired an extension may be added to the top of the door (either steel or wood) to bring the hanger over the side wall. In this case it is not necessary to have the side track higher than the front track, but they can be put on the same level by using the cast corner bracket, Figure 4. The application of this bracket is shown in the upper left hand corner of Figure 2. For wide openings a series of two or more doors may be hung on a double track, as shown in Figure 5. Automatic control of garage doors is, of course, the most desirable solution of the problem. In climates such as that of Canada it is necessary that doors be kept

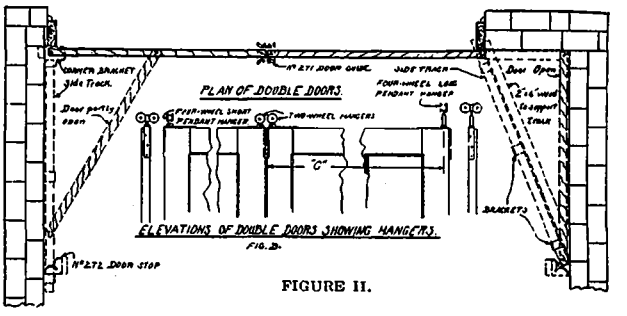


FIGURE II.

closed as much as possible, and in a busy garage there is a continual running to and fro from the office to the door. Several devices operated by electricity have been placed on the market, and make a strong appeal, the idea of opening and closing the doors by pressing a button from a stationary position inside being especially attractive. The operating device is controlled by push buttons; one button opens the doors, another closes the doors, and the other button stops the doors at any point. The control buttons can be placed at any point in the building. It is a simplified device, made of unbreakable steel parts and actuated by an electric motor. It is placed above the door level, and does not occupy any valuable space, and can be installed by any electrician. Figure 6 shows a garage door of this type, the device being applicable to any type of door.

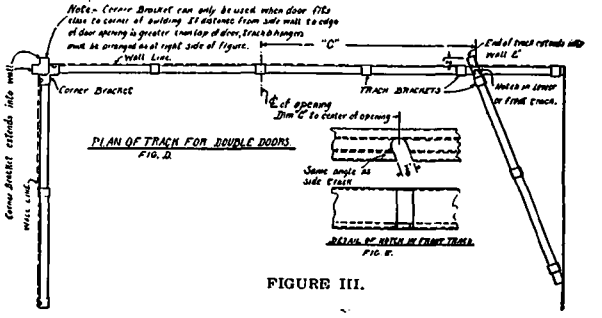


FIGURE III.

The Cause of a Low Bid

The public, as a general rule, when inviting competitive bids on any piece of work, usually gives consideration only to the lowest bid received.

Apparently the lower the bid, the more consideration it receives. This procedure has brought about a condition in competitive bidding that is of danger to the public. It is creating an effort totally toward cheapening every piece of work, without proper consideration as to its quality.

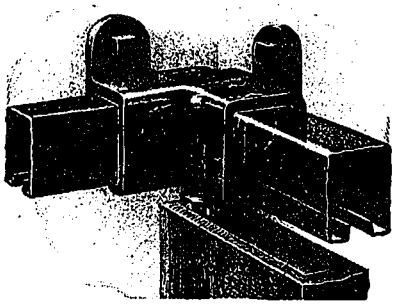


FIGURE IV.

The income tax return reports, Federal Trades Commission report, and the data collected all over this country, show the terrible condition of affairs in structural contracts.

Contractors are of the opinion that one of the greatest causes for losses in construction work is ignorance of the cost; the next greatest cause is lack of proper capital.

The several reasons why bids are too low, architects and contractors enumerate as follows:

First—An absolute ignorance of the cost of the work contemplated.

Second—A destructive desire to cut the other fellow's bid, no matter at what loss to themselves.

Third—An effort to make the original bid as low as possible, even below cost if necessary, and take the chance to recoup on substitution or extra work.

FIGURE V.

The public is awakening to the fact that accurate knowledge of the costs of manufacturing is the ultimate salvation of the manufacturing business of this country.

In so far as the overhead expenses are concerned, this idea has not been accepted by the majority of contractors; some make the statement that they have no overhead expenses; this might obtain in certain cases where the contractor pays no license or taxes of any sort, and carries no protective insurance; nor has any of the incidental expenses that tend to his responsibility.

FIGURE VI.

As long as the public is demanding cheap work, it is unquestionably getting it, and everyone knows where less than cost is paid by any individual, the consumers, as a whole, including himself, ultimately pay the shortage, thus maintaining ever and ever the equation.—"Building Review."

Higher Cost of Building and Living

Added to the high cost of living, which has affected practically everything that we consume or wear, is another factor, the influence of which will be felt during the coming year—the high cost of building. During the boom years, every town and city in Canada, almost without exception, saw more buildings erected than were necessary. For three years speculative building has been at a standstill, and houses for renting purposes have not been built. With the growth of industry in all centres, there has been created a demand for modern houses of moderate size on the part of mechanics and others enjoying increased wages. Taking Toronto as a typical example, there are no such houses available. All houses erected within the past five years—built either to sell or rent—are now occupied. The only vacant houses are some of the close-in old-time residences too large for a renting family to occupy, and unsuitable as rooming houses owing to the fewness of the rooms for the size of the building to be heated. It is impossible to rent a modern house in Toronto at the present time. Apartment houses are not only filled, but most of them have a waiting list. There is an insistent demand for houses and apartments that must be met. From the conditions existing, W. W. Pearse, whose position as city architect and superintendent of buildings, coupled with a keen analytical mind, adds judicial weight to his opinion, in conversation with the editor of CONSTRUCTION, expressed the firm belief that the year 1917 would see greater building activity in Toronto than for several years past. "The buildings must be built," said Mr. Pearse, "to supply the demand, in spite of the higher cost of materials and the scarcity of labor."

It follows that rents will increase to pay interest on the extra investment, thus adding another, and a very vital element, to the increased cost of continuing to occupy this mortal sphere.

Daylight Saving in Australia

The daylight saving bill recently passed by the Federal Parliament provides that all clocks throughout Australia shall be put forward one hour at the end of September, and put back again one hour at the end of March each year. The object of the Act is to utilize more daylight in the early part of the day and give more daylight after business hours to all persons throughout the Commonwealth.

Competition Postponed

Consul-General J. I. Brittain reports from Sydney, Australia, that owing to war conditions the reception of designs in the Federal Parliament House competition for Canberra has been postponed.

Garage Elevator Equipment

IN deciding what type of elevator to install in a garage many things have to be considered—the size of the building, the number of floors, the number and size of the autos to be handled, and not least of all, the amount the owner is willing to invest in this part of his equipment. While a hand-power machine might answer in a small garage, moving cars from one floor to another only occasionally, it would be entirely inadequate for a modern city garage, having several floors and handling cars every hour of the day and night. If the elevator service is poor, the whole business is affected. If the elevator breaks down, the garage customers cannot get their cars down from the upper floors, and usually are not slow to express their minds. It is poor economy to install a "cheap" elevator in a garage.

The hand-power elevator is only advisable where the cost is to be kept to a minimum, where the travel distance is short and the service light.

The hydraulic plunger elevator is less expensive usually than the electric for a short travel, providing a water pressure of sixty pounds or over is available. Care must be taken that the valves and piping are heated to protect against freezing in winter. When kept packed to prevent leaking this type is very satisfactory, and the fact that the water service is seldom cut off as compared with electric power is very much in its favor.

The electric elevators, however, are the type most used, and with the spread of electric power, are steadily gaining over others. The electric elevators may be divided roughly into two groups—the belt driven and the direct connected. Before the elevator motor and controller had been brought up to their present efficiency the practice was to drive a countershaft from the motor by a belt and drive the elevator gearing from the countershaft by two belts—one crossed to run in the opposite direction to the other. On the driving shaft of the elevator gearing are idler pulleys running freely one on either side of the driving pulley keyed to the shaft. Suitable shifting devices shift one or other of the belts from the idler pulley into the driving pulley, and this causes the elevator to run up or down as required. One objection to this type is that it is necessary to first start the motor and shafting before the elevator can be used, and they continue running after the elevator has stopped, thereby wasting power; also there is the additional wear and tear on belts and noise of running belts and pulleys. On the other hand, this type of elevator will stand more hard usage and abuse than where the motor starts and stops each time with the elevator. Further, where electric current is purchased on the horse-power or peak load rating, and not by meter, the power bills will be smaller with the double or shifting belt elevator. A smaller motor may be used, since the motor is up to full speed, when load is thrown on and the momentum of the motor and countershaft helps to overcome the inertia of elevator machinery and load.

In most of the cities, however, power is now furnished on a meter basis, and for this reason it is more economical to use an elevator controller to stop and start the motor with the elevator, driving the latter by a belt, or having the motor direct coupled to the gearing. The former is known as the single belt elevator, and meets the need for elevators of moderate capacity, with speed up to forty or fifty feet per minute, where the owner is not willing to install the more expensive but much better direct connected type. With proper type of motor, controller and safety devices, both direct current or alternating current may be used with equally good results. The motor should be designed to meet the requirements of this service—to start up under full load from rest without excessive inrush of current, and with alternating current, a circuit breaker device should be used to protect against phase reversal and single phase conditions.

The direct connected elevator is the best suited for heavy capacities and higher speeds. An elevator of this type recently installed in the Willys-Overland, Limited, plant, at West Toronto, has a capacity of five thousand pounds, with speed of ninety feet to one hundred feet per minute. The machine has tandem worm gearing, interlocking type, with right and left-hand worms, so that the thrust of one worm gear is counteracted by the other. The worms are cut from a one-piece steel forging, the worm wheels have phosphor bronze rims mounted upon heavy castiron hubs. The gear teeth are accurately machined to mesh with the driving worms and with one another. A heavy castiron housing encloses the worm gearing, which runs in an oil bath. The cable drum does not depend for driving on any keys in the drum shaft, but is bolted to the worm wheel centre, which has a flange extended through the side of the gear case for this purpose.

The motor is twenty-five horse-power capacity, slip ring type, with high starting torque to suit alternating current, twenty-five cycle, three-phase, five hundred and fifty volts.

The controller, mounted above the motor, is semi-magnet type, mechanically operated from a hand lever in the car. Car switch full magnet control can also be furnished when desired. In this case the simpler control with fewer magnets

was desired. The controller admits the current to the motor to make it run in the proper direction, closes the circuit to the oil immersed A.C. brake magnet, which opens the brake shoes and then cuts out the starting resistance gradually to start the elevator smoothly and accelerate to full speed.

The car is about nine feet wide by twenty feet front to back, giving plenty of room to handle the largest automobiles. It is constructed with steel frame work, strongly braced, and hardwood floor. The sides are enclosed with steel wainscotting, and the top is protected by a heavy wire screen.

The elevator is equipped with numerous safety devices, each of which protects the elevator against a possible contingency.

Should the power be cut off or the fuses burn out, the magnet brake will instantly release, and the brake shoes will be applied and stop the elevator.

If the car should meet any obstruction while it is descending, a safety swiach cuts off the power and stops the machine.

Below the car are the safety grips—heavy steel jaws operated by a powerful wedge action, and connected by cable to a safety speed governor at the top of the elevator wellway. If the car attains a speed, say, twenty-five per cent. above normal from breaking of cables, or any other cause, the governor grips the connecting cable, and holding it, causes the safety jaws to clamp and then gradually tighten upon the guide rails until the car is brought to a stop.

If an operating cable should break, or anything go wrong with the hand lever in the car, the machine automatically shuts off the power at top and bottom, and, if for any reason whatever the car should run past the top or bottom landings, the hatchway switch will be opened, cutting off the power lines. Beyond these again are spring buffers in pit under the car, and counter-balance weights to cushion the stop should the car go that far beyond the limits.

The machinery is mounted on heavy steel beams, with reinforced concrete floor, leaving slots for the cables to pass through to the car and counter-balance. The guide rails are cold drawn steel T-rails, securely bolted to the walls of the wellway. Two sets of counter-weights are used—one attached directly to the car, the other to the winding drum. Their combined weight is heavier than the car, so as to counterbalance the average load in order to secure economical operation. The door openings are protected by sliding balanced gates covered with wire mesh.

Electric light and annunciator on the car complete the equipment, which is of the highest grade and efficiency throughout.

Small Concrete Garages

BECAUSE of the necessary presence of gasoline and oils required for car operation and maintenance, there has been considerable increase in the fire menace wherever an automobile or motor truck has been added to one's personal property.

Some cities and towns have passed ordinances with a view to regulating the housing of motor cars and providing storage for gasoline, so there are a few car owners who enjoy some safeguards against the menace of the automobile.

Instead of being built of permanent fireproof materials, most garages in the past have been built of impermanent and thoroughly combustible ones—built to increase fire risk rather than reduce it. Some day insurance companies and fire protection associations may be able to influence legislation that will solve the garage problem from the standpoint of compelling that all structures where automobiles are housed shall be built of fireproof materials.

Concrete may be applied in garage construction in several ways—monolithic, concrete block, stucco on metal lath supported by metal frame, to say nothing of concrete tile and concrete brick. Yet the full advantages of concrete from the standpoint of fire-safe construction are not realized unless the material is used to build the entire structure. When built two storeys high, so that living quarters are provided for a chauffeur and his family, fire-safe garage construction implies that the floor of the second storey should be of concrete.

There is a peculiar combination of merit and adaptability in concrete. Structures built of it are not only fireproof, but the architect or builder can reproduce many very pleasing types of architecture. Concrete means permanence, and that means doing away with the annual expense of painting, repair and other maintenance which represents such a burden where impermanent construction is used.

Some have had the impression that concrete is costly as compared with other types of construction. As a matter of fact, conditions in the building materials line have been such that for a long time concrete structures have been built in many places for the same price as less durable construction would have cost. Where there have been occasional exceptions to this, the slight additional first cost has soon been offset by the saving in maintenance and insurance.

Everywhere increasing preference is being shown for concrete construction, not only in

cities, but in many rural districts and towns.

Thousands of miles of permanent concrete pavement now provide three-hundred-and-sixty-five-days-a-year roads through communities that formerly were all but inaccessible at certain seasons of the year owing to the bad condition of the highways. The fact that permanent concrete highways are increasing in mileage in strict accordance with their increase in popularity, suggests that the automobile should leave the permanent concrete highway only to enter the permanent, fireproof, concrete garage.

If careful thought is given to planning a garage, a number of desirable features may be incorporated in the structure that will not materially increase expense, yet will add considerably to the convenience of the structure. One of these consists of a repair pit of suitable dimensions, over which a car can be run when necessary to go underneath to clean it or make light repairs.

At one end there should be a small work bench with vise and other necessary tools all placed in front of a window where good light will add to the ease of making repairs. For the same reason, windows should be low enough so that interior lighting will be low down on the car rather than up toward the ceiling. All fireproof construction implies windows with wire glass in metal frames, and iron shutters outside, especially where the garage is located near other buildings. This secures effective protection from within and without in case of fire, and in view of the value of the average car, it is just as advisable to protect it from without as to protect other structures from the menace of the car. Fireproof doors also should be used.

Under no circumstances should a heating plant be placed in the structure. If near the house, and there is a steam or hot water heating system in the residence, pipes may be extended to the garage. Otherwise a separate heating plant must be maintained outside of the garage. In the country it may not be desirable to heat the structure. In the town or city, the residence and garage are usually located on the same lot, not far from each other, and therefore connection can readily be made to the house heating system if desirable.

A gasoline storage tank of steel, encased in six inches of concrete, and equipped with a gasoline pump, should be placed outside of the garage underground, and say, ten feet distant from the structure. The top of this tank may be two feet below ground level. Pipe and pump connections should be a part of the tank equipment, and should lead into the garage, although the inlet for filling the tank should be out of doors.

Open lights and fires must be avoided around the automobile on account of the prevalence of gasoline vapor. When artificial light is necessary, only electric lights should be used, and the wiring should conform to the requirements of the Board of Fire Underwriters, so that danger of fire from improper electric circuits will be eliminated. When electric light is not available and the garage must be entered at times when artificial light is necessary, doors and windows should be opened for a few moments in order to release any accumulation of gasoline vapor.

If the car is to be washed at times inside the garage, then a drain should be provided at a central point in the floor, which should be sloped toward this drain, that in turn should be connected with a pipe leading to a sewer line or similar outlet. If the car is to be washed out of doors, then a small concrete-paved area at the front of the structure will serve as a convenient washing platform, and prevent a mudhole. Locker room for storing blankets and miscellaneous car accessories will suggest themselves as desirable conveniences to be provided. These, of course, should not be considered as a part of the cost of the building but rather as the cost of gratifying individual tastes and desires.

Certainly an automobile or a motor truck represents sufficient investment to warrant protection against fire. Likewise the increased danger of fire that the automobile or motor truck introduces warrants housing such a vehicle in a structure that will confine fire that may break out in the garage to that structure only and prevent damage to nearby buildings.

Influence of Foreign Ingredients on Steel

An important paper by Dr. J. E. Stead, read at the annual meeting of the Iron and Steel Institute recently, discussed the effect of small quantities of phosphorus, sulphur, manganese, copper and tin on the qualities of steel. Attention is drawn to the need of greater precision in describing experiments on various steels. For example, in recording the results of tests of tensile strength, the dimensions of the test-pieces should be stated, and, in dealing with normalizing and annealing, the temperature of heating and the time of cooling to below redness should be recorded. Speaking generally, the deleterious effects of impurities appear to have been exaggerated. Thus the effect of phosphorus within 0.1 per cent. is comparable with that of carbon, and 0.13—0.20 per cent. is desirable to give good machining properties. Phosphorus alloyed with iron also makes the metal less liable to corrosion. While sulphur *per se* may cause "red-shortness" in small quantities, it is actually beneficial provided manganese is also present. Silicon up to 1.5—1.75 per cent. increases the limit of ductility and tensile strength, while copper, in quantities less than 0.5 per cent., has little or no influence on the mechanical properties. Tin, however, in any sensible quantity should be avoided, as it makes the steel difficult to roll, and hard and stiff when heated.

Civil Engineers' Annual Meeting

WITH the formation last year of a Committee of Society Affairs to deal with problems confronting the society, and to bring in recommendation for its betterment, there commenced what promises to be a new era in the history of the Canadian Society of Civil Engineers.

The convention held in Montreal on January 23, 24 and 25, in the society's building, at 176 Mansfield street, has stirred up more interest on the part of the members in society affairs than any meeting for several years. The most important feature was the acceptance by the society of the committee's report of fourteen recommendations, published in the January issue of CONSTRUCTION.

At the opening session, the chair being occupied by J. H. Duggan, President, the reports of Council, Library Committee, Treasurer, Finance Committee, and reports on branches were read. In the afternoon session the following committee reports were read and discussed: Conservation, Roads and Pavements, International Electro-Technical Commission, Steel Bridge Specifications, Educational Requirements, Sewage Disposal Sanitation, General Clauses, and Steam Boiler Specifications.

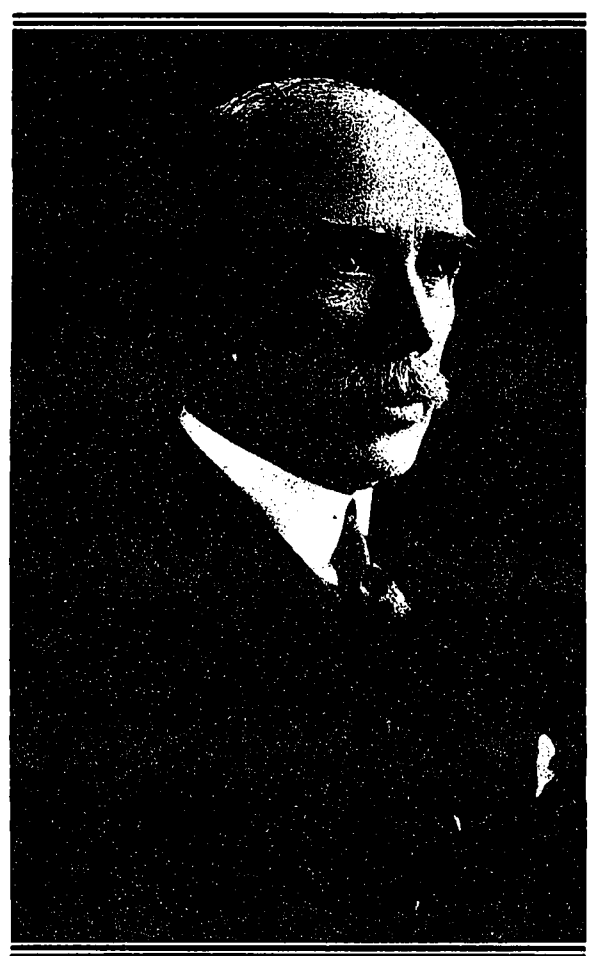
CONSERVATION.

Bearing upon the relations of the society with the development of Canada, the report of the Committee on Conservation is of particular interest. In part it follows:

"The events of 1916, and especially of the past few weeks, have served to emphasize more forcibly than ever, the relation of economic efficiency to national strength and safety," says the report. "Among the concrete achievements of the past year, the conclusion of a treaty whereby Canada and the United States will cooperate in the protection of migratory bird life should prove of inestimable service to agricultural and forest production, the two chief branches of Canadian primary industry."

Continuing the report says: "As a result of recent action the future economic development of the Dominion will benefit by the aid and guidance of systematic industrial research. The appointment of the Industrial Research Commission by the Dominion Government and the corporate enterprise of the Canadian Pacific Railway in promoting scientific research will enable Canadian industry to utilize the services of two highly organized institutions. In the same manner as the forest industries are now in receipt of the services of the Forest Products Laboratories at Montreal, every form of industry should be enabled to avail itself of expert assistance in the solution of its peculiar problems. To achieve the maximum results industrial research must be linked up with a thorough system of technical education.

"Town planning progress merits special mention as a conservation movement. During the opening decade of the century, Canada invested approximately $600,000,000 on municipal growth, largely for civic improvements. Heavy additional expenditures have been made since 1910. The efficient investment of capital on such a large scale cannot be secured as long as municipal development continues in haphazard manner. Adequate legislation and administrative machinery must be provided to control and guide urban expansion. During the past year



JOHN STOUGHTON DENNIS, C.E., D.L.S., D.T.S., PRESIDENT CANADIAN SOCIETY OF CIVIL ENGINEERS.

distinct progress has been made in this direction, and it is hoped that every Province in the Dominion will shortly possess proper provision for thorough control of housing and town planning.

"It is gratifying to record the decision of the Ontario Government to remodel its forest protective service along the most approved lines. The remarkable development of our pulp industry indicates the potential value of our forests

and the wisdom of affording the most efficient protection obtainable. The work of determining the extent of our timber resources progresses steadily, surveys of British Columbia and Saskatchewan forests having been completed during the past year."

The report of the Council stated that the total membership was 3,047, and that twenty-one members had given their lives for the Empire in the European war. A total of $1,966 had been subscribed to the fund in aid of families of members enlisted for active service, while $722 had been subscribed for the Canadian Engineers' Hospital and Medical Comforts Fund. The receipts of the society during the year had been $23,726, and there was a balance in hand of $3,642.

James White, vice-chairman of the Commission on Conservation, said that Col. Leonard had forwarded a paper by Leonard Curtiss, who believed that the influx of British immigration into Canada after the war will be largely increased, and it would be a great problem to keep them from massing in the cities. In South Africa after the Boer War the country could not absorb the population, and a large proportion of the disfavor in which South Africa was held by people in Great Britain was due to the failure of the country to absorb the British labor.

M. J. Butler, C.M.G., asked whether the Research Council which had been appointed by the Government were going to do anything definite and get into a position to be able to give the manufacturers help in definite problems; and was anything specific being done in connection with after war problems.

R. A. Ross, of Montreal, who is a member of the Advisory Research Council appointed by the Government, explained the work of the Council, and said that the manufacturers must help the Council if they wanted the help of the Council. They must let them know what raw materials they were using, what quantity, and where they got them from, and similar information.

The Council had access to a great deal of information which was buried in Government files at present, and which they intended to disinter and put into practical shape. He felt sure the Council would be able to give practical service on the problems of Canadian manufacturers.

Mr. White, speaking about the Commission of Conservation, remarked that it was poorly named and should be called the Commission for Economic Development of Canada, which was its real work.

The President, Mr. Duggan, delivered an address at the afternoon session, in which he gave some interesting statistics on the growth and development of the society. In 1887 the city of Montreal had 30 to 40 per cent. of the membership, the area bounded by Toronto, Ottawa and Montreal 65 per cent.; the district Port Arthur to Montreal, 80.5 per cent., and the district west of Port Arthur only 7.4 per cent. In 1916 Montreal had decreased to 17.4 per cent., the Toronto, Ottawa and Montreal area, 36.7 per cent., and the district Port Arthur to Montreal 65.5 per cent. The district east of Montreal had remained practically stationary, being 12.8 per cent. in 1887, and 11.9 per cent. in 1916, but the district west of Port Arthur had increased from 7.4 per cent. to 23.4 per cent. Montreal still maintained its lead in actual numbers over any other city, having 367 corporate members, against 168 in Ottawa, which had the next largest number. While there had been a large increase in the number of members in the districts tributary to Montreal, there had been a much larger percentage of increase in the number of members west of Port Arthur, so situated that they could only reach Montreal at much expense and with considerable loss of time. It was to be expected that members so situated should feel strongly that they were best served as regarded their daily work by the local associations, and had little interest or sympathy in the general work of the society as it existed to-day. His impression was that this attitude had increased largely of late. Its tendency under the present organization was to still further increase, and if they were to build up a strong national society, representing the whole profession in Canada, it was a factor to which most earnest consideration must be given. In 1906 there were only two branches, while in 1915 there were ten branches, with 30 per cent. of the whole membership. In 1887 the members were 53 per cent. of the total membership; in 1916, 22.6 per cent.; associate members in 1887 were 15.4 per cent.; in 1916, 52.5 per cent., or, classing juniors with associate members, 57.8 per cent. Summarizing, the percentage of members had dropped from 53 per cent. to 22.6 per cent., while percentage of associate membership had risen from 15.4 per cent. to 52.5 per cent.

In the evening the visiting members were entertained by the local society to a dinner at the University Club, which was followed by a smoker and entertainment at the society's headquarters. On Wednesday morning, as guests of the Dominion Bridge Company, the members visited this firm's plant and its subsidiary companies engaged in munition work, and were later entertained to a dinner by them at the Windsor Hotel. The afternoon session was further taken up with reports of committees.

ELECTION OF OFFICERS.

The election of officers resulted as follows:

President—J. S. Dennis, Montreal.

Vice-Presidents—J. M. R. Fairbairn and Lieut.-Col. C. N. Monsarrat, Montreal; A. St. Laurent, Ottawa; T. H. White, Vancouver.

Past Presidents—G. H. Duggan, Montreal;

M. J. Butler, C.M.G., Montreal, and F. C. Gamble, Victoria, B.C.

Treasurer—E. Marceau, Montreal.

Secretary—C. H. McLeod, Montreal.

The eight new councillors elected were: Messrs. R. A. Ross and J. C. Smith, Montreal; H. Longley, St. John, N.B.; A. R. Decary, Quebec; Jas. White, Ottawa; G. A. McCarthy, Toronto; Wm. Pearce, Calgary, and J. H. Kennedy, Vancouver.

The rest of the council remains as before.

The new President, Lieut.-Col. John Stoughton Dennis, C.E., D.L.S., D.T.S., is assistant to Lord Shaughnessy, President of the Canadian Pacific Railway Company. He was born in Toronto in 1856, being a son of the late Lieut.-Col. J. S. Dennis, who was the first Surveyor-General of Canada, and later the first Deputy Minister of the Inferior. Mr. Dennis was educated in Upper Canada College, and graduated from the Military College, Kingston. He graduated as a topographical surveyor in 1877, and for several years was engaged on survey work for the Dominion Government. From 1879 to 1882 he was engineer and surveyor for the Hudson's Bay Company. In 1896 he entered the service of the Northwest Territorial Government as chief engineer, and in 1899 became Deputy Minister of Public Works in the Northwest Territory. In 1902, Mr. Dennis joined the service of the Canadian Pacific Railway. Since that time his career has been one of progress, the important development of the C.P.R. lands in Alberta being directly in his control. All who have been associated with Mr. Dennis will agree that in electing him to the position as President of the Canadian Society of Civil Engineers the society will receive the benefit of his broad experience and training, coupled with his keen judgment and a progressiveness that will mean much for the society.

Quebec Association of Architects

Members of the Province of Quebec Association of Architects held their annual meeting on January 13th, at the rooms of the association, Beaver Hall Square, Montreal. In the absence of Mr. E. B. Staveley, the president, the chair was occupied by Mr. Hugh Vallance, first vice-president.

The annual report of the council was presented by the chairman. This referred to the deaths during the year of Mr. F. X. Berlinguet, one of the founders of the association, and of Mr. Gordon Blackader, killed in action in France. The question of amending the charter of the association had been considered by the Legal Committee, the object being to render it more explicit, and thus to do away with any more adverse decisions by the courts, as had happened lately in the Court of Reviews. Amendments to the charter were presented to the Quebec Legislature at its last sitting, in December, 1916, and were adopted after some modifications which were found acceptable under the circumstances. The committee believed that the association at last would be a closed one, such as those pertaining to lawyers, notaries, doctors, etc. The committee on quantity surveying had considered the question of introducing this system in the Province of Quebec. The committee, after collecting data from various sources, was of opinion that there were two principal difficulties to contend with before a system could be put into operation. The first was the matter of getting the contractors to act unanimously, as a great divergence of opinion had been expressed by those who had been approached. The second was to establish a competent and responsible board of quantity surveyors to properly handle the amount of work that would be involved. The incoming council should continue the study of the question and endeavor to obtain the co-operation of both architects and contractors. On the motion of Mr. Archibald, seconded by Mr. A. Beaugrand-Champagne, the report was adopted, after discussion by Messrs. Archibald, Doran, Vanier, Beau-Grand-Champagne, Chausse, J. Venne and Monette.

The treasurer's report showed receipts of $7,181, including a balance of $4,734 was brought forward, and expenditure of $5,954, including a purchase of $2,977 of war bonds, the balance in hand being $1,226. In the report of the Quebec section it was stated that Mr. E. B. Staveley had been re-elected president, and Mr. J. S. Bergeron, secretary and treasurer. The balance in bank is $149. A discussion on a reduction of fees, proposed by Mr. Jos. Perrault, and seconded by Mr. W. S. Maxwell, followed. It was agreed, on the motion of Mr. Beaugrand-Champagne, seconded by Mr. J. Venne, that the fees of members remain at $15.00, and those of the students be reduced to $2.00. This was carried.

The election of the officers for 1917 resulted as follows: President, Mr. Hugh Vallance; First Vice-President, Mr. G. A. Monette; Second Vice-President, Mr. J. H. LeBon; Secretary, Mr. J. Emile Vanier; Treasurer, Mr. D. Norman MacVicar. Members of the Council: Messrs. U. J. Asselin, Alphonse Piche, A. Beaugrand-Champagne, J. M. Miller and E. I. Barott. Delegates to Royal Architectural Institute of Canada are to be: Messrs. Alcide Chausse, D. R. Brown, J. P. Ouellet, Herbert Raine and Jos. Perrault.

Some correspondence between Sir Robert Borden, Hon. R. Rogers and the society relative to plans submitted to the Department of Public Works for the erection of Government buildings in Ottawa was read. It was then agreed to hold the next meeting of the association in Quebec.

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FRASER S. KEITH - - - EDITOR AND MANAGER

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Influence of Professional Bodies

Why a professional body such as the Canadian Society of Civil Engineers does not exert a greater influence in the affairs of the country is a question that is giving the members particular concern at the present time. There is not another organization in Canada composed of an equal number of men whose members individually possess a higher standing in their respective community than the members of the Canadian Society of Civil Engineers.

When we consider the qualifications for leadership possessed by many members of the Society, their expert knowledge, their breadth of vision, and their sterling qualities, it is little short of paradoxical that the Society, as a whole, plays no greater part in our national development. All material human progress has had its foundation on engineering in some one or other of its branches. In a country like Canada the engineer is the greatest individual factor in the country's expansion. The Canadian Society of Civil Engineers, composed of three thousand trained men, is potentially a great national asset, yet from the viewpoint of collective influence, it is as undeveloped as the mineral and timber areas of British Columbia and the idle prairie lands of the West.

Why?

Because the objects of the Society as outlined in the Constitution and as followed out in practice are self-centred.

The word "Civil" in the name is unquestionably a drawback, because of the prevailing acceptance of the term "Civil Engineer." This can be overcome by the adoption of a title such as the "Institute of Canadian Engineers," or the "Canadian Engineering Institute," but the fundamental basis of the Society's apparent failure to measure up to its opportunities for national usefulness *will not be surmounted* until the expressed and practiced objects of the Society are of a broader nature.

No man can live unto himself alone, and no group of men can combine to operate within a defined circle and expect its greatest achievement when that circle is narrower than the one prescribed by the radius of influence of the broadest and most influential of its members.

To achieve its real function, and the function that the ability and training and experience of its individual members qualify it to accomplish as a mere matter of natural destiny, the Canadian Society of Civil Engineers must broaden its objects and give greater thought and discussion to national affairs and be the centre from which broad and practical suggestions for the most effective development of our national resources are inspired. When this is done, the engineering profession in Canada will occupy a different position and realize, as it should realize, the outstanding place of national influence that its importance warrants and which in the evolution of national efficiency which Canada must shortly undergo, the profession should naturally assume.

Shipbuilding Possibilities

Puget Sound shipyards, according to figures compiled by the Seattle Chamber of Commerce, are engaged on contracts totalling thirty-eight million three hundred and seventy-five thousand dollars. These shipbuilding activities employ five thousand eight hundred men, who receive seven hundred and fifty thousand dollars monthly. These figures indicate clearly that an industry has sprung into being in the State of Washington, over night as it were, on a scale of importance that warrants serious consideration by the authorities in Canada. We have already a small amount of shipbuilding on the Pacific coast on Burrard Inlet, and recently a company has announced the commencement of operations at the mouth of the Pitt River, where it joins the Fraser River, a few miles above New Westminster. In the light of what the Washington shipyards are accomplishing, it would appear that we had barely started. It will take many years after the war to supply the ship wastage, and the demand for ocean-going ships will be heavy from every maritime country in the world. It is evident that this is an industry upon which Canadians might concentrate to advantage, both from personal profit and the opportunity it offers of building up a much needed merchant marine.

The Montreal Builders' Exchange

ANNUAL MEETING HELD JANUARY 22.

Mr. J. P. Anglin Elected President.

Despite the fact that the building permits issued in Montreal in 1916 were less than those of the previous year, the members of the Montreal Builders' Exchange found that, commencing with the middle of the year, they had, as a rule, all the business they could handle.

At the annual meeting of the Exchange, the report of the secretary, D. K. Trotter, which included the balance sheet for the year, was read and approved, showing the affairs of the Exchange to be in a satisfactory condition, in view of conditions generally in the building trades. The chair was occupied by John Quinlan, retiring president.

The meeting unanimously adopted a resolution favoring the creation of a Bureau of Municipal Research in Montreal, and another advocating the study of preferential tariff within the Empire.

The officers elected for the ensuing year are: President, J. P. Anglin; first vice-president, W. C. Munn; second vice-president, Robert F. Dykes; directors, Alex. W. Bremner, Alen Charette, L. J. Conroy, A. Cross, T. D. Douglas, W. M. Irving, D. McCuaig, W. E. Potter, J. J. Roberts, J. E. Walsh, and W. E. Ramsay.

"In presenting you with my report for 1916," said Mr. Quinlan, in delivering the President's annual address, "I do so with the feeling in which, I believe, you all share—that we have passed through one of the most eventful years in the history of this Exchange. The war which is now in its third year keeps steadily progressing; and, while we have reached the point when we can safely say that there is absolutely no doubt of the ultimate result, we still find it necessary, in order to bring about its speedy and satisfactory conclusion, to give the Allies the first call on our men and material. You have felt the full force of these altered circumstances, and it speaks well for your various organizations that the vast majority of them have steadily maintained and increased their standing and reputation.

"While the building permits issued by the City of Montreal would indicate an amount of building done in 1916 considerably less than that of 1915, the figures do not by any means give a correct idea of the amount of construction work handled by you in the year which has gone. As a matter of fact, if we were to take an inventory of the actual business done by each member of this Exchange we would find that our operations in 1916 more nearly approached the normal than the city figures would indicate. The season started in with little or no business offering, but the demand for building increased with the advent of midsummer and autumn until we found ourselves in the position where it was not a question of how much work we could get, but how suitable labor and materials could be secured speedily enough to fill the contracts offering. Of course, the great demand was for factories and munition plants of all kinds. Most of these structures were built outside of the limits of the City of Montreal, hence the reason for their not appearing in the statistics furnished by its building department, and most of them were erected within a radius of a hundred miles by Montreal contractors, and I have the greatest pleasure in complimenting you on the speed and thoroughness with which you carried out these contracts under conditions which were far from ideal. I will, indeed, venture to say, gentlemen, that the erection of some of these plants by you created a record in speed and thoroughness which has never before been reached.

"At the moment the building contracts in sight for 1917 do not seem quite so many, but nevertheless the general public are prosperous, and we may expect to see in the near future a more general demand by our citizens to own their own houses and to occupy larger and better ones. During the last three years Montreal has grown, but the number of new houses erected in that time forms a small percentage of the total amount of building operations. There are at present few vacant houses in the city, and already a demand is growing for homes of all descriptions. We must also expect a large increase in the number of existing school buildings and a still greater number of factories.

"The period of this war has been productive of many new difficulties, but I believe that the close of the war especially will present more varied and acute problems to be solved. For one thing the amount and quality of available labor and its assimilation into the industrial life of our city and province will require careful study, and we, as builders and as citizens, must be prepared and organized to deal with these subjects in a manner satisfactory to all the interests involved. Canada has at present about 400,000 men in khaki, recruited largely from the ranks of the skilled mechanics. Every effort will, I am sure, be made by you on their return to place them in positions for which their training and experience fit them.

"Naturally the difficult conditions of the past year have been reflected in the ordinary work of the Exchange. While attendance at our meetings has not been so large and the interest of members not so great as could be wished, nevertheless an appreciable amount of work has been done, and the Exchange is being regarded more and more as an organization with a watchful eye on all matters affecting the interests of its members, and whose power to effect reforms and rectify abuses in our trades and the conditions under which they are operated is limited only by the amount of active interest you take in the work of your directors and the support you give them.

"Your Exchange has during the latter part of last year concerned itself mainly with the inauguration of an exchange for the hire and sale between our members of contractors' machinery not in use, and with pressing upon the Hon. Mr. Taschereau certain amendments to the bill which he introduced last session at Quebec and succeeded in having adopted, regarding the privileges of workmen, supply men, sub-contractors, and contractors. As soon as your directors learned that it was the intention of the Provincial Minister of Public Works to bring forward this measure they appointed a representative and influential committee to study the subject, frame, if necessary, other and more suitable amendments, and in general to take care that the interests of our members were not jeopardized. In order to obtain as wide an expression of opinion as possible your board, at the request of this committee, called a general meeting of the Exchange, when many valuable suggestions from the members present were received. Suggestions were also invited from other bodies. The bill as finally approved by the Legislature improves but little the position of the workmen, the supplier of materials, and of the sub-contractor, and leaves the general contractor as he was. The work of your committee was rendered particularly difficult by the fact that this was a Government measure, and the greatest pressure had to be brought to bear in order to have our amendments considered. Further, the short time that elapsed between the printing of the bill and its presentation to the House increased our difficulties, and it speaks volumes for the watchfulness and diligence of this committee that they safeguarded our interests so well. The heartiest thanks, not only of the members of this Exchange, but also of every builder and building supply man in the Province of Quebec are due its members. A copy of this bill as soon as printed will be mailed to each member. I may remark in passing that perhaps a good deal of the dissatisfaction that existed among our ranks in regard to the previous Lien Law was due in a measure to the fact that every member did not exercise his privileges, and I would strongly urge each one of you, as soon as you are acquainted with the terms of the new measure, to exercise your rights to the full. The law has not been amended to our entire satisfaction, and the only way we can convince the Government that the suggestions we submitted were in the best interests of the building public and the business interests we represent, will be for each one of us to exercise, as soon as possible and necessary, our rights under it. Should we all do this, I am convinced that within six months the Government will be constrained to prepare a new bill, and there will be no necessity for us to agitate in the matter at all.

"In regard to the exchange for the sale and hire of machinery, inaugurated a short time ago, arrangements are practically completed, and more enquiries for the use of equipment are being received than can be satisfied. There can be no doubt that the scheme has great possibilities for our members, especially in regard to convenience and economy, and those of you who have plants lying idle will help to make the plan a success and of benefit to yourselves and your fellow-members by having your lists of machinery available for the purpose sent in as speedily as possible.

"It is a pleasure to recall that some of our members who were noted for their skill in construction work are now engaged in pulling up and tearing down—in smashing German lines and German frightfulness. I refer specially to Brigadier-General Loomis, to Major Cape, to Assistant Deputy Quartermaster-General McRitchie, to Paymaster Murray, and to the Bonnell brothers. I am proud to call these gentlemen fellow-members, and I am sure I express your thoughts when I state that they will finish the contract they have presently on hand on schedule time, fully in accordance with the specifications, and to the entire satisfaction of their clients—the British Empire. We wish them all a happy and speedy return; and when their present job is finished, and we know from their past record how well it will be done, we shall be honored to have, as we have had before, the benefit of their co-operation, their counsel, and their riper experience."

TORONTO BUILDERS' EXCHANGE.

Annual Meeting held January 22nd, 1917.

The work of the Provincial Builders and Supply Associations convention at Ottawa last year, and the coming convention to be held at London, February 13th, 1917, were discussed. The delegates instructed to ask for co-operation regarding Dominion, Provincial, and municipal contracting, and for more favorable treatment of Canadian architects, engineers, contractors and manufacturers, and that Canadian materials be used exclusively, as far as possible, in all public buildings, specifically calling attention to the Lindsay Arsenal. The proposed amendment to the Workmen's Compensation Act regarding first aid and the compensation of medical practitioners, was under discussion, and it was resolved to ask the Board to pay this compensation by a levy upon not only the employers and Government, but the workmen as well, also to regulate such compensation by adoption of a set scale.

Topics covering the general good of the Exchange, and the duty of every member to fill up his particular section of the trade, was resolved upon.

The following officers were elected for the ensuing year: President, S. R. Hughes; first vice-president, W. E. Dillon; second vice-president, Walter Davidson; treasurer and acting secretary, Jno. Aldridge; directors, Ed. Gearing, Chas. Bulley, Geo. Gander, Geo. Oakley, Jr., A. D. Grant, Wm. Clark, Jr.

BUILDERS' EXCHANGE PRESIDENT.

The newly elected president of the Montreal Builders' Exchange, Mr. James Penrose Anglin, is vice-president and managing director of Anglin's, Limited, Montreal. Mr. Anglin received his education at Queen's and McGill Universities, graduating from the latter with the degree of B.Sc. Among the leading buildings constructed by Mr. Anglin's company are: The McGill University Engineering Buildings; Goodwins, Ltd.; Edward VII and Strathern Public Schools; C.P.R. Windsor Station Power House; Canadian General Electric Building; Northern Electric and Manufacturing Company; Belding Paul Corticelli, Ltd.; St. Lawrence Sugar Refinery; Montreal Light, Heat and Power (garage); Loyola College; Toilet Laundry (extension), Montreal Foundling Hospital; Williams Manufacturing Company; Bell Telephone Company, etc., etc., all in Montreal; also Bell Telephone Company; Canadian Ingersoll Rand (two buildings), and Walter Blue Factory in Sherbrooke, Que., Canadian Vickers, and numerous branch bank buildings for the Bank of Montreal and Molsons Bank throughout Canada, as well as other leading structures in Ottawa, Quebec and Halifax.

CONSTRUCTION NEWS

Information of Special Interest to Architects, Contractors, and Manufacturers.
Construction Building Reports will Give You Up-to-date Information Every Day on all New Buildings About to be Erected or in Course of Erection.

BUSINESS BUILDINGS.

Hamilton, Ont.—The Grand Trunk Railway Company are erecting a freight office and shed on Ferguson avenue north, to cost $30,000; J. H. Gordon is the local agent.

London, Ont.—Architect L. A. Carrothers, Bank of Toronto building, has received tenders for the erection of a Hydro office for the Utilities Board, to cost $75,000.

Niagara Falls, Ont.—H. W. Johns-Manville Co., Ltd., 19 Front street east, Toronto, have been awarded the roofing contract on a bank to be erected for the Royal Bank of Canada, to cost $15,000; W. G. Read, 489 Victoria avenue, Niagara Falls, has been awarded the plumbing contract; Ireland & Dinham, Glenholme avenue, are the general contractors; C. M. Borter, Main street, is the architect.

North Bay, Ont.—The Imperial Bank has purchased a site on Main street west for the erection of a bank building.

Port Colborne, Ont.—Architect C. M. Borter, Main street, Niagara Falls, is preparing plans for an office and storage building for the Canada Steamship, Ltd., head office, Montreal.

Renfrew, Ont.—M. J. O'Brien, Renfrew, Ontario, has been awarded the general contract for the erection of a business block for the Jamieson Meat Co., Ltd., Renfrew, to cost $15,000; B. Evan Parry, Renfrew, is the architect.

St. Catharines, Ont.—The Great North Western Telegraph Company will proceed immediately to rebuild their offices, which were destroyed by fire.

Toronto, Ont.—Plans are being prepared for an office building on Adelaide street, near Bay, to cost $150,000, for S. Frank Wilson & Sons, 73 Adelaide street west. Architects Chapman & McGiffin, 95 King street east, are preparing plans for an office building for the Toronto Harbor Commission, 50 Bay street, to cost $150,000.

Windsor, Ont.—John Rutherbough, 1000 Wellington street, London, has been awarded the general contract for the erection of an office building for the Huron and Erie Mortgage Corporation, London, to cost $65,000; Watt & Blackwell, Bank of Toronto building, London, are the architects.

Vancouver, B.C.—The Imperial Bank of Canada has purchased a site at the corner of Homer and Hastings streets for the erection of a new bank to cost $130,000.

CIVIL ENGINEERING.

Hamilton, Ont.—Tenders will be called early in the spring for the erection of a subway at Dundurn Park, to cost $8,000; E. R. Gray, City Engineer.

CLUBS, HOSPITALS, THEATRES, AND HOTELS.

Byron, Ont.—Eggett & Company, 336 Ridout street, London, have been awarded the plumbing contract in a sanitarium for the London Health Association, London, to cost $75,000; Hyatt Brothers, 289 Edgerton street, London, are the general contractors; Watt & Blackwell, London, are the architects.

Hamilton, Ont.—Geo. Frid Company, Bank of Hamilton building, have been awarded the mason contract in an addition to a hospital for the Hamilton Health Association, to cost $15,000; Cully & Breay, 35 King street west, have been awarded the electric wiring contract; Otis-Fensom Elevator Co., Toronto, have been awarded the elevator contract; Stewart & Witton, 7 Hughson street south, are the architects. Work will commence in the spring on a club house for the Royal Hamilton Yacht Club, to cost $30,000.

Toronto, Ont.—Architect Howard Crane, Detroit, Michigan, and Hynes, Feldman & Watson, 105 Bond street, associate, are preparing plans for a moving picture theatre to be built at the south-west corner of Richmond and Victoria streets, to cost $250,000.

Kingston, Ont.—Simmons Brothers, 132 Princess street, have been awarded the heating and plumbing contracts in the addition to Queen's University, for the Military Hospital Commissions, Ottawa; J. Vince, 160 Clergy street, has been awarded the painting contract; McFarlane, 310 Johnson street, has been awarded the carpenter contract; W. S. Symons, 14 Vittoria street, is the architect.

FIRE LOSSES.

Amherst, N.S.—The International Engineering Works, Limited, boiler shop was destroyed by fire; loss $30,000.

Amherstburg, N.S.—The Empress Theatre was destroyed by fire; loss $25,000.

Belleville, Ont.—Jas. F. Chisholm, Thurlow Twp., City Limits, Belleville residence was destroyed by fire; loss $7,000.

Brampton, Ont.—The Public School Board, High School was destroyed by fire; loss $25,000.

Brockville, Ont.—The telephone exchange and lighting plant for the village of Athens, Leeds County, was destroyed by fire.

Danville, Que.—The Danville Chair and Specialty Company factory was destroyed by fire; loss $40,000.

Drummondville, Que.—The Aetna Chemical Company, Drummondville, Quebec, plant was destroyed by fire.

Hamilton, Ont.—The Grand Trunk Railway freight office and shed at Hamilton was destroyed by fire; loss $22,000.

Kenora, Ont.—St. Alban's Protestant Cathedral was destroyed by fire; loss $15,000.

Montreal, Que.—Fire which broke out at 1691 Notre Dame street east, Montreal, did damage amounting to $50,000.

Montreal, Que.—Jennings & Company, Wellington and Grey Nun streets, warehouse was destroyed by fire; loss $25,000.

Niagara Falls, Ont.—The American Cyanamid Company, Niagara Falls factory was destroyed by fire; loss $150,000.

Niagara Falls, Ont.—J. P. Lang, 2032 Whirlpool street, Niagara Falls, N.Y., business block at the corner of Park street and Clifton avenue, was destroyed by fire; loss $15,000.

Peace River, Alta.—"Diamond P" store was destroyed by fire; loss $30,000.

Preston, Ont.—The Preston Car and Coach Company factory was destroyed by fire; loss $60,000.

Prince Rupert, B.C.—The Merryfield Block, Prince Rupert, was destroyed by fire; loss $15,000.

Quebec, Que.—J. B. Renaud & Company, and A. J. Turcotte & Sons, warehouses were destroyed by fire; loss $125,000. The Hotel des Marchand was destroyed by fire; loss $30,000.

Quebec, Que.—The beautiful parish church of St. Louis de Courville, in Montmorency county, was destroyed by fire; loss $100,000. Three buildings on St. Joseph street were destroyed by fire; loss $150,000.

Sherbrooke, Que.—The St. Anthony's Roman Catholic Church at Lennoxville was destroyed by fire; loss $30,000.

St. Catharines, Ont.—The Great North Western Telegraph Company offices at St. Catharines were destroyed by fire; loss $6,500.

Sydney, N.S.—McCallum's carriage shop and a few small adjoining buildings were destroyed by fire; loss $30,000.

Tillsonburg, Ont.—W. C. Brown residence was destroyed by fire; loss $6,000.

Toronto, Ont.—Robert Watson, 363 Sorauren avenue, factory was destroyed by fire; loss $20,000.

Tyndall, Man.—The Wallace sandstone quarries plant here was destroyed by fire; loss $250,000.

Vancouver, B.C.—The warehouse of Wood, Vallance & Leggatt, Limited, 573 Carrall street, was destroyed by fire; loss is estimated at about $500,000. Fire damaged the physics building of the University of Vancouver to the extent of $5,000.

Winnipeg, Man.—The interior and furnishings of the Grace Methodist Church were destroyed by fire; loss $15,000.

Winnipeg, Man.—Jobbin-Martin Company's wholesale grocery, on Market street east, was destroyed by fire; loss $150,000.

MISCELLANEOUS.

Brantford, Ont.—The City of Brantford contemplates the erection of a police station.

Brantford, Ont.—The Ontario School for the Blind contemplates the erection of a dairy building; James Govan, Provincial Architect, Parliament Buildings, Toronto.

Fordwich, Ont.—The village of Fordwich contemplates the erection of a public drive shed on Schwandt property.

Hamilton, Ont.—E. R. Gray, City Engineer, will receive tenders in the spring for the erection of bath houses for the City of Hamilton, to cost $13,000. The Park Board of the City of Hamilton contemplates the erection of a park pavilion at Watasso Park, to cost $15,000; A. P. Kappele is the secretary. Bethlehem Steel Company, Hamilton, have been awarded the steel contract in a garage for Thos. Ramsey, 15 Market square, to cost $15,000; T. Ramsden, Lister block, has been awarded the carpenter contract; Isbister Brothers, 65 Hughson street, are the general contractors; E. B. Patterson, Hamilton, is the architect.

Lindsay, Ont.—S. Victoria Agricultural Society contemplates the erection of fair ground buildings.

Lindsay, Ont.—H. T. Hickey, Peterboro, has been awarded the general contract for the erection of a cold storage for Flavelle, Ltd., Kent street, to cost $50,000; G. M. Miller & Company, 93 Yonge street, Toronto, are the architects.

London, Ont.—John Rutherbough, 1006 Wellington street, London, has been awarded the general contract for the erection of a garage for Roy Moore, London, to cost $6,000; John M. Moore, 421 Richmond street, is the architect.

Mitchell, Ont.—Fullerton, Logan & Hibert, Agricultural Hall, contemplates the erection of an agricultural hall; A. J. Blowes is the secretary.

Ottawa, Ont.—R. C. Desrochers, Secretary Department of Public Works, has received tenders for Tungsten lamps for the Departmental Building at Ottawa.

Paris, Ont.—Architects Barber & Nicolls, Temple building, Brantford, are preparing plans for a Y.W.C.A. building, to cost $30,000.

Paris, Ont.—Schultz Brothers, Brantford, have been awarded the general contracts for the erection of an addition to Mill Number 1 for Penman's, Limited, Paris, to cost $35,000; work will commence in the spring.

Port Arthur, Ont.—Architect L. M. Jones, City Engineer, is preparing plans for an addition to the fire hall on Court street, to cost $7,000. Plans have been prepared for a pulp mill for the Port Arthur Pulp and Paper Company, to cost $1,000,000, T. R. H. Murphy, chief engineer.

Preston, Ont.—The Preston Car and Coach Company will commence work in the spring to rebuild their finishing and forge shops, which were destroyed by fire.

Smith's Falls, Ont.—The Canadian Cooperage Company, Smith's Falls, Ontario, will rebuild their stave, hoop and saw mill, which was destroyed by fire.

Sudbury, Ont.—Engineer W. J. Brule has prepared plans for

a nickel and copper refinery for the British American Nickel Company, 20 Victoria street, Toronto, to cost $500,000.

Toronto, Ont.—Work will commence on a garage for S. G. Whaley, Yonge street, near Briar Hill, to cost $10,000.

Toronto, Ont.—Architects Darling & Pearson, 2 Leader lane, Toronto, will call for tenders in about a month for the erection of a mausoleum at Mt. Pleasant Cemetery, to cost $200,000, for the Toronto General Burying Ground Trustees, Confederation Life Building.

PLANTS, FACTORIES, AND WAREHOUSES.

Acton, Ont.—The Reliance Shoe Company, 350 Sorauren avenue, will invite tenders in the spring for electric wiring and steam heating in their factory, to cost $15,000; J. B. MacKenzie, Georgetown, Ontario, is the general contractor.

Cardinal, Ont.—A. J. Byers, University street, Montreal, has commenced work on a factory for the Canadian Starch Company, to cost $20,000; The Dominion Architectural Iron Company, Montreal, have been awarded sheet metal contract; J. H. Hunter is the engineer.

Chatham, Ont.—Libby, McNeil & Libby, Chicago, Ill., U.S.A., contemplates the erection of a factory at Chatham, to cost $100,000.

Cobourg, Ont.—The Federal Steel and Foundry Company contemplates the erection of a steel plant to cost $250,000.

Dundas, Ont.—The Chapman Engine and Manufacturing Company, Dundas, will rebuild their factory, which was destroyed by fire.

Ford City, Ont.—The Canadian Lamp and Stamping Company, Ford City, have postponed the project of erecting an addition to their factory until the spring.

Ford City, Ont.—Architects G. Jacques & Co., 5 Sandwich street west, Windsor, Ontario, are preparing plans for an addition to the factory of the Canadian Lamp and Stamping Company, Edna street, to cost $27,000.

Hamilton, Ont.—L. O. Buist, 93 Emerald street south, contemplates the erection of an addition to the factory to cost $30,000.

Hamilton, Ont.—J. E. Rideau & Son, 12 Ferguson avenue, Hamilton, have been awarded the roofing and sheet metal contracts on a factory for the Tallman Brass and Metal Co., Wilson street, to cost $50,000; the Hamilton Bridge Works, Bay street, have been awarded the steel contract; E. Goodall, 96 Aikman avenue, is the general contractor; Stewart & Witton, 7 Hughson street, are the architects. The Chipman, Holton Knitting Company, 122 St. Mary street north, will erect an addition to their factory on Glendale avenue, to cost $60,000; McPhie & Kelly, Bank of Hamilton building, are the architects. The Spectator Printing Company, 28 St. James street south, has purchased a site for the erection of a newspaper plant, to cost $150,000, at the corner of King and Catherine streets. The B. F. Goodrich Rubber Company, Akron, Ohio, U.S.A., contemplates the erection of a factory to cost $100,000. New plans are being prepared for a factory for W. T. Rawleigh Medicine Company, 78 Duchess street, Toronto, to cost $100,000; nothing, however, is likely to be done for six months or perhaps a year.

Hepworth, Ont.—The Hepworth Light and Power Company contemplates the erection of an addition to their power house plant, to cost $15,000.

Kingston, Ont.—The Canada Light, Heat and Welding Company contemplates the erection of a factory to cost $500,000.

London, Ont.—G. H. Bolton, President Board of Trade, London, contemplates the erection of a factory to cost $50,000.

London, Ont.—A. Eisenach, c-o London Industrial Association, London, contemplates the erection of an automobile factory, to cost $100,000.

Niagara Falls, Ont.—The Watt Tolygonal Tool Company contemplates the erection of a factory.

Niagara Falls, Ont.—The American Cyanimid Company will rebuild their hydrating plant at once.

New Toronto.—Bennett & Wright, 72 Queen street east, have been awarded the piping contract in a factory for the Goodyear Tire and Rubber Company, 152 Simcoe street, Toronto, to cost $750,000; W. D. Spengler is the engineer; the Dominion Construction Company, 14 Wellington street, Toronto, are the general contractors. The Consolidated Plate Glass Co., 241 Spadina avenue, Toronto, have been awarded the glass contract in a factory for the Dominion Abrasive Wheel Company, to cost $65,000; Bavington Brothers, 44 Conduit street, have been awarded the painting and glazing contracts; Robert Rennie & Son, 198 Dupont street, has been awarded the roofing contract; A. B. Ormsby, Ltd., 48 Abell street, have been awarded the metal sash contract; the Dominion Bridge Company, Imperial Life building, have been awarded the steel contract; Toms Construction Company, Kent building, Toronto, are the general contractors.

Ottawa, Ont.—Architect J. A. Ewart, Booth building, is preparing plans for a printing plant for The Rolla L. Crain Printing Company, to cost $150,000.

Peterboro, Ont.—Gastine Company, New Jersey, U.S.A., contemplates the erection of a factory; R. G. Johnston, 265 Burnham street (Ashburham), Peterboro, is their local representative.

Toronto, Ont.—J. W. Keens, 68 Spadina road, contemplates the erection of a factory.

Toronto, Ont.—Baines & Peckover, 98 Esplanade street east, have prepared plans for a warehouse at the foot of Cherry street, to cost $25,000.

Toronto, Ont.—Fashion Waists, Ltd., 86 Claremont street, will invite tenders in the spring for the erection of an addition to their factory to cost $8,000. The work on a warehouse for Cassidy's, Limited, 51 St. Paul street west, Montreal, has been postponed until conditions are more favorable.

Toronto, Ont.—Jackson-Lewis Company, Bell Telephone building, have been awarded the general contract for the erection of an aviation plant for the Imperial Government, to cost $200,000; McGregor & McIntyre, 1139 Shaw street, have been awarded the steel work contract; John M. Lyle, 19 Avondale road, Toronto, is the architect.

Toronto, Ont.—The Imperial Munition Board will erect a munition plant at Ashbridge Bay, to cost $3,000,000; J. D. Flavelle, chairman. The Imperial Government has purchased a site at the corner of Dufferin street and Lappin avenue for which to build an aviation plant, John M. Lyle, 19 Avondale road, is the architect. The Imperial Munition Board of Canada, Ottawa, contemplates the erection of a munition plant at the Central Prison site, Strachan avenue. Wells Brothers Company of Canada, Ltd., Church street, have been awarded the general contract for the erection of an addition to the factory of Wm. Davies, 621 Front street east, to cost $5,000. The Turnbull Elevator Company, 126 John street, contemplates the erection of a factory at the corner of Bloor and Lansdowne avenue. Architect W. Williamson, 137 Woodbine avenue, has prepared plans for the erection of an addition to the factory of E. Leadlay & Company, 87 Front street east, to cost $25,000.

Ridgeway, Ont.—The Canadian Chicago Bridge and Iron Co., Limited, contemplates the erection of an addition to their plant at Bridgeburg.

St. Catharines, Ont.—Geo. H. Archibald, 23 Jordan street, Toronto, has been awarded the general contract for the erection of an addition to a factory for the Kinleith Paper Company, St. Catharines, to cost $7,000; The Trussed Concrete Steel Company of Canada, Limited, 23 Jordan street, Toronto, have been awarded the reinforcement contract; Denison & Stephenson, 18 King street, Toronto, are the architects.

St. John, New Brunswick.—Fraser, Limited, Fredericton, contemplates the erection of a pulp and paper plant at Edmundston, Madawaska County.

Wahnapetli, Ont.—The British American Nickel Company, 20 Victoria street, Toronto, is clearing a site for the erection of a power plant along the main line of the Canadian Pacific Railway at Wahnapetli, Ont.

Wiarton, Ont.—Canada Furniture Manufacturing Company contemplates the erection of a factory addition.

Windsor, Ont.—Brenner Brothers, 184 Horton street, London, has purchased a site for the erection of a cigar factory.

Winnipeg, Man.—The Richardson Grain Separator Company, Minneapalis, contemplates the erection of a factory.

Winnipeg, Man.—J. D. McArthur, Winnipeg millionaire contractor, will erect an enormous paper and pulp plant near Winnipeg.

PUBLIC BUILDINGS AND STATIONS.

Fort William, Ont.—The Canadian Northern Railway have selected a site for the erection of a station on Vickers street, to cost $50,000.

Hamilton, Ont.—The Toronto, Hamilton and Buffalo Railways, Hamilton, are preparing plans for an addition to their station on Hunter street, to cost $20,000; R. L. Latham is the architect.

Renfrew, Ont.—The Calabogie Light and Power Company contemplates the erection of a sub-station at Renfrew.

Welland, Ont.—J. C. Diffin, Brennan block, Welland, has been awarded the general contract for the erection of a transformer station for the Welland Hydro Electric Commission, to cost $18,000, on Lincoln street and Hillems avenue.

RESIDENCES, STORES, AND FLATS.

Hamilton, Ont.—Architect E. B. Patterson, 143 Wentworth street, is preparing plans to convert stores into apartments for Ed. Mathews, 221 John street north, to cost $5,000. Miss Edwards, 216 Jackson street west, is having plans prepared to convert a hotel into apartments, to cost $5,000.

London, Ont.—Plans are in preparation for a bungalow for Norman A. Roberts, 155 Ridout street, to cost $5,000.

Oakville, Ont.—Architects Chapman & McGiffin, 95 King street east, Toronto, are preparing plans for a residence for H. G. Kelly, 65 Castle Frank road, Toronto, to cost $20,000.

Ottawa, Ont.—The Corporation of Ottawa contemplates the erection of a detention home on Bronson avenue, to cost $25,000; Mr. McCallum, City Hall, is the architect.

Ottawa, Ont.—Louis Lemieux, 140 Laurier avenue, and Hector Leblanc, Kent street, have been awarded the general contract for the erection of a teachers' residence for Grey Nuns, Ottawa, to cost $45,250; J. D. Cheve, 163 Notre Dame street, Hull, is the architect.

Toronto, Ont.—Alexander McLeod, 57 Benlamond avenue, has been awarded the general contract for the erection of a residence for John A. Brady, 43 Benlamond avenue, to cost $5,500.

Toronto, Ont.—The Ina Grafton Homes, Limited, contemplates the erection of an apartment house to cost $100,000; J. J. Gibson, General Manager, Chartered Trust and Executor Co., Traders Bank building, is the treasurer.

Toronto, Ont.—Saul & Page, 58 Balmoral avenue, have been awarded the general contract for the erection of a residence on Dale avenue for Alfred W. Reid, 87 Pleasant boulevard, to cost $5,500; Harry Payne, 58 Harvie avenue, has been awarded the heating and plumbing contracts.

Walkerville, Ont.—A. Selby, 29 Elliott street, Windsor, has been awarded the mason contract in a residence for F. Porter, c-o American Auto Trimming Company, to cost $5,000; W. Dupuis, 147 Dougal avenue, Windsor, has been awarded the carpenter contract; Pennington & Brian, 47 Sandwich street, have been awarded the sheet metal contract; McNaughton & McKay, 216 Wyandotte street, have been awarded the electric wiring contract; N. Fielding, 53 Devonshire road, Walkerville, has been awarded the heating and plumbing contracts; J. C. Pennington, La Belle building, Windsor, is the architect.

SCHOOLS, COLLEGES, AND CHURCHES.

Chatham, Ont.—The Public School Board of Chatham contemplates the erection of an addition to the McKeough School, and also contemplates an addition of four rooms to Queen Mary's School. The Union School Sections No. 16 Dover and No. 23 Chatham Township, contemplates the erection of a school.

Highland Creek, Ont.—The Board of School Trustees contemplates the erection of a school.

Keene, Ont.—The Board of School Trustees contemplates the erection of a school.

Quebec, Que.—Architect Pierre Tevesque, 115 St. John street, Quebec, is preparing plans for a church for the trustees of St. Benjamin, to cost $15,000.

St. Catharines, Ont.—The Niagara Street Methodist Congregation contemplates the erection of a church to cost $25,000.

Quebec, Que.—Table & Roberge, Ste.-Marie, Beauce, Quebec, have been awarded the general contract for the erection of a church for the Trustees of St. Damase, Mataue County, Quebec, to cost $41,350; Pierre Tevesque, 115 St. John street, Quebec, is the architect.

Toronto, Ont.—The Board of Education, 263 College street, contemplates an addition of four rooms to Parkdale Collegiate. The Board of Education, 263 College street, contemplates an addition to Jarvis Street Collegiate.

Architects, engineers and contractors are invited to contribute information on construction work, whether it be proposed or in progress, and such information will be published in these columns.

CONTRACTORS and SUB-CONTRACTORS

As Supplied by The Architects of Buildings Featured in This Issue

Building, Garage, Automobile and Supply Co., Ltd., Toronto, Ont.
Brick, Fancy, Milton Brick Co., Ltd., Toronto, Ont.; Plain, Don Valley Brick Co., Ltd., Toronto, Ont.
Boilers, Gurney Foundry Co., Ltd., Toronto, Ont.
Casements and Window Construction, Henry Hope & Sons, Ltd., Toronto, Ont.
Cement, A. Rogers, Ltd., Toronto, Ont.
Concrete Work, Crescent Concrete Co., Toronto, Ont.
Crane, Herbert Morris, Crane and Hoist Co., Ltd., Toronto, Ont.
Electric Fixtures, McDonald & Willson, Ltd., Toronto, Ont.
Electric Wiring and Apparatus, Bennett & Wright, Ltd., Toronto, Ont.
Elevators, Otis-Fensom Co., Ltd., Toronto, Ont.
Expanded Metal, Baines & Peckover, Toronto, Ont.
Fire Doors, A. B. Ormsby Co., Ltd.
Flooring, Terazzo Floor by Italian Mosaic and Marble Co., Ltd., Toronto.
Glass, Metropolitan Glass Co., Ltd., Toronto, Ont.
Hardware, Springer Hardware Co., Ltd., Belleville, Ont.
Hollow Tile, Sun Brick Co., Ltd., Toronto, Ont.
Oil Burner, Fess System of Canada, Ltd., Toronto, Ont.
Plumbing, Keiths, Ltd., Toronto, Ont.
Plaster Work, E. J. Curry, Toronto, Ont.
Power Machinery and Pump, National Equipment Co., Ltd., Toronto, Ont.
Reinforcing Steel, Baines & Peckover, Toronto, Ont.
Structural Iron Steel, McGregor & McIntyre, Ltd., Toronto, Ont.
Vault Doors, J. & J. Taylor, Ltd., Toronto, Ont.
Water Heater, Ruud Automatic Gas Heater Co., Toronto, Ont.
Water Tank, Ontario Wind Engine and Pump Co., Ltd., Toronto, Ont.

HUGE ORDER FOR STEEL.

An order has been placed by the architects who are erecting the new mammoth department store at the corner of Yonge and College streets for 13,000 tons of steel. This is for the framework of the immense structure. The manufacturers have received imperative instructions to start delivery at the earliest possible date. The city architect of Toronto recently issued the permit for the first section of the new building, and the plans for the other sections are under examination.

CATALOGUES and BOOKLETS

Garage Door Equipment, published by the Richards-Wilcox Canadian Co., Ltd., London, Ont., is a complete booklet that deals particularly with this important subject. By the use of drawing and illustrations their various products are described. Solutions for the various problems which arise when hanging the garage door are offered. Door schemes for the smallest as well as the largest garage are presented in this catalogue, and described and illustrated elsewhere in this issue. This company maintains a special department, which is prepared to co-operate with the architect in solving any problem that may arise, and blue prints in detail are supplied upon request.

Structural Timber Handbook on Pacific Coast Woods.—The purpose of this book is to present information relative to structural timber, which will be useful to architects, engineers and contractors. Particular attention has been given to Pacific Coast species. A brief description is given of the four principal species of wood found. An effort has been made to present data showing the strength and durability of these woods. Tables show safe total loads on columns of various sizes, and other tables give the maximum spans for mill and laminated floors, board measure for dimensions and lengths, and board measure and weight for unit lengths of Douglas fir dimension timber. A considerable amount of data is presented on the creosoting of Douglas fir lumber in various forms.

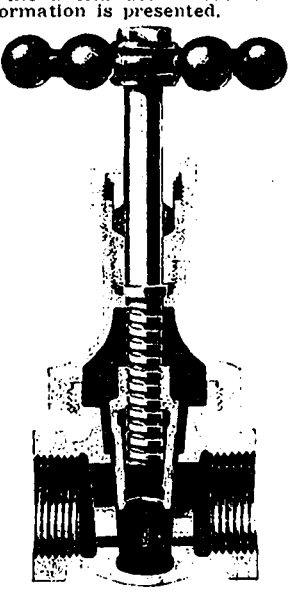
Data and figures are given on timber frame-brick mill building, showing costs, insurance rates, and details of construction. Copies of this book may be had by addressing The West Coast Lumberman's Association, 1016 White Building, Seattle, Wash.

Chemistry and Agriculture.—In the annual report of the Division of Chemistry, Dominion Experimental Farm, for the year ending March 31, 1916, prepared by Frank T. Shutt, M.A., D.Sc., Dominion Chemist, and recently issued by the Dominion Department of Agriculture, considerable attention is devoted to the study of the subject of "Sugar Beets for Factory Purposes."

In this report, Professor Shutt states that this "investigation carried on now a number of years, has conclusively shown that beets of excellent quality for sugar extraction can be grown in many widely distant portions of the Dominion." Among the factors to be considered, in sugar beet growing, are the quality of the beet, labor, with its availability and cost. Considerable space is also given to results of investigations carried on to ascertain the relative value of field roots. The results of these point out clearly that care must be exercised in selecting the variety, or varieties, of field roots grown. In the analysis of some thirty-six varieties of mangles the richest root contained 13 per cent. dry matter and 5.66 per cent. sugar, while the poorest contained 7.32 per cent. dry matter and 2.86 per cent. sugar. These great and important differences represent real differences in feeding values. The same is true with turnips, analysis, showing that between the richest and poorest of some thirty-three varieties there existed a difference of 5.58 per cent. dry matter, which, assuming that the feeding value is measured by the percentage of dry matter, means that two thousand pounds of the best variety are equivalent to three thousand eight hundred and sixty pounds of the poorest. Further investigations were carried on with regard to fodders and feeding stuffs, and a large number of fertilizing materials were analyzed during the year. The report also contains the result of investigational work with fertilizers conducted by supervisor, B. Leslie Emslie, on the Experimental Stations at Fredericton, N.B., and Kentville, N.S. This report, which contains much valuable information, can be obtained on application to the Publications Branch, Department of Agriculture, Ottawa.

Bulletin No. 1017, Intercommunicating Telephone Apparatus.—The unprecedented high cost of line construction and maintenance materials is causing telephone companies to spend more time on intensive development of territory now served with wire facilities than upon expansion into new fields of operation. There is reported an increasingly large demand for use in factories, business houses and residences, with connections to the telephone company's exchange. The class of service furnished is very attractive to the operating company, as the rates earned are in higher proportion to the capital investment than for regular subscribers' station service. The Stromberg-Carlson Company furnishes instruments, cables and accessories in six, twelve, twenty-two and thirty-two station sizes, and three types of telephones, viz., wall, desk and combination types. Each telephone is fitted with the same standard type apparatus used in regular subscribers' station equipment, except that the signaling between the local stations is of the battery call type employing direct current vibrating ringers. The equipment of each telephone includes a three-position switching key with the required number of buttons for selecting and calling all other stations and the exchange. It is only necessary for the user of the telephone to press a button once to connect with the line wanted and to ring the desired station. The key buttons interlock by means of a tumbler plate and are restored to normal whenever any other button in the same key box is depressed. To answer a call one presses the home station key button and responds in the usual way. The system operates from two sets of dry cells, each set having a voltage of from nine to fifteen volts, depending upon the size of the system. In buildings wired with alternating current, a bell-ringing transformer may be used in place of one set of dry cells for furnishing the ringing current. Full metallic wiring between all stations is carried in waxed core cables made especially for this service. The cables are furnished in two types, with painted braid or lead covering. The cables and apparatus are cross-talk proof, and any number of connections up to the carrying capacity of the system can be established at the same time without interference through cross-talk, cross-ringing, or other inductive effects. Complete instructions are furnished with each system which simplifies the work so that an electrician with no previous telephone experience can easily install the apparatus in proper working order. The complete equipment for systems of this type, as well as that required for systems having no exchange connections for private installations, is illustrated and described in the Stromberg-Carlson Telephone Mfg. Co.'s "Bulletin No. 1017," which will be sent free upon application to the Toronto office, 110-12 Church street.

Valves and Steam Specialties, Catalogue No. 25, issued by the Penberthy Injector Company, Limited, Windsor, Ontario. This catalogue describes in detail, the steam specialties and valves manufactured by this company. Particular attention is called to Compodisk valves, which are designed with external thread construction, this method preventing straining of body, stripping of threads, makes the connection non-corrosive, and permits the valve to be easily taken apart. It is claimed these valves are a decided improvement over the ordinary type of composition disc valves. Practical information regarding automatic injectors, lubricators, ejectors, and brass specialties is given in a comprehensive manner, and by the liberal use of cuts and drawings, necessary and useful information is presented.



This company have lately added a gate valve to their list of products. This gate valve is designed along the same lines that characterize their other line of valves, and embodies the same feature, the external thread construction, which refers to the method of fastening the bonnet to the body of the valve. This construction is conceded to be superior to the old method of screwing the bonnet into the inside of the valve, as it is impossible for the threads at this connection to become corroded, and the valve is always accessible, and can be taken apart at any time without the liability of straining it. This feature also prevents the enlargement of the bonnet end of the valve causing loose-fitting threads and permits of a more compact valve body, consequently a stronger one. The disc employed is a solid wedge type which eliminates the trouble found in the split disc design. All gate valves manufactured by this company are registered and approved by all Provinces. Literature of interest to all users of steam goods will be mailed upon request.

PERSONAL.

Ross & Macdonald, architects, have moved their offices from 908 Royal Bank Building to 61 Front Street West, Toronto.

G. Jacques & Co., architects and engineers, of Windsor, Ontario, have moved their offices in that city from 5 Sandwich street west, to the Peninsular Security Building, Chatham street west, and would be pleased to receive manufacturers' samples and catalogues.

Mr. Frank A. Spangenberg, who has been associate of Mr. C. S. Cobb for the past three and a half years, is leaving for Buffalo, N.Y., where he will be located with Messrs. Lansing, Bley, & Lyman. Mr. Spangenberg's architectural experience has been gained through association with some of America's foremost firms, covering a period of thirteen years. In the year of 1909 to 1913 he studied architectural design in Atelier Prevot, New York City, and Columbia University. In 1913 Mr. Spangenberg was chief designer and chief draughtsman for Austin W. Lord, architect, Isthmian Canal Commission (of Lord & Hewlett, architects, New York City). His work in Toronto has been particularly devoted to the National Sanitarium Office Building, the new Registry of Deeds and Land Titles, the W. J. Gage residence, and the C. S. Blackwell residence.

CHANGE IN MANAGEMENT.

Changes in the management of MacKinnon, Holmes & Co., Limited, of Sherbrooke, Que., have recently taken place, caused by the retirement from the company of Mr. A. R. Holmes, who in the past has occupied the position of director and secretary-treasurer.

It is understood that Mr. J. W. Bowman, president, and Mr. G. D. MacKinnon, vice-president and general manager, have purchased the holdings of Mr. A. R. Holmes and his friends, and new directors, in the persons of Dr. A. W. Klein, of Greenwich, Conn., M. L. MacKinnon, and J. Nicol, of Sherbrooke, Que., have been elected with Mr. F. C. Johnston, secretary-treasurer.

The business will be conducted as in the past under the management of Mr. G. D. MacKinnon, and it is understood the company is making extensive plans for future development.

This company has been particularly successful in its general business of structural steel and steel plate work, having one of the most complete plants in the country for these special lines. It has also been successful in the forging of shells for the Imperial Munitions Board, having a very complete and up-to-date plant for this special work.

INVESTIGATIONS OF GRAVITY AND ISOSTASY.

Recent investigations of gravity and isostasy are discussed and summarized in Special Publication No. 40 of the United States Coast and Geodetic Survey, a quarto volume of one hundred and ninety-six pages illustrated by numerous plates and charts.

The survey for a number of years has been carrying on geodetic investigations of isostasy with special reference to the effect of isostatic compensation upon the deflection of the vertical and the intensity of gravity. Four previous reports on these investigations have appeared, the first one in 1909 and the last in 1912. The present volume gives the results of further study of the relation between gravity and isostasy. In it are embodied the gravity data resulting from the previous work.

The conclusions which may be drawn from the investigation reported in this volume substantiate to a great extent the conclusions arrived at from previous investigations. This is considered important because seventy per cent. more gravity stations in the United States were used at this time than in the preceding gravity investigation, and many stations in Canada, India, and Europe for which data were available were also used. Copies of the volume may be obtained at sixty cents each from the Superintendent of Documents, Government Printing Office, Washington, D.C.

CONTRACT AWARDED.

The British Cordite Co., Ltd., have recently executed a contract for ten 400 h.p. Murphy furnaces to be installed in their new plant at Nobel, Ont.

INSTRUCTIONS TO STEEL INSPECTORS IN THE FIELD.

By Elwyn E. Seelye.

The purpose of this article is to bring out the essential points to look for when inspecting a steel frame.

It is assumed that the structure has been properly designed and that the shop work has been properly executed. It should be emphasized at this point that shop inspection and mill inspection are very important. The reasons for that are numerous. Some of the most important of them are as follows: Where steel is being rolled and some orders are being inspected the rejected material is apt to be unloaded on the purchaser who does not have inspection. In fabricating, if there is no inspection, the plans may not be followed accurately, causing delay and expensive field changes at the site, also, as will be noted later in the article, certain errors of fabrication are not apparent after the fabrication is complete.

Now presupposing the steel has been shipped in perfect order and is arriving on the site, the inspector should first look it over for damages, due to shipment. These will generally appear as bent plates or members. All these damages should be rectified by straightening, and, if necessary, by reinforcing, before the erection is allowed to proceed. If damage is serious an expert should be called in to pass on it. Where no shop inspection has been made, the field inspector should go over the riveting and see that surfaces in direct bearing are milled and in contact.

The important thing in the erection of bases, either grillages, steel plates or cast iron, is to see that they are properly grouted. This can best be done by pouring the grout into a funnel raised high enough to produce a hydraulic pressure. The space between the concrete foundation and the iron should also be rodded to eliminate voids. It is very important that the bases be set level, faced on the top and that the column be faced to provide a full and even bearing between the bottom of the column and the base. In unimportant columns a discrepancy may be wedged with thin steel wedges, but in important work the full bearing without wedging should be insisted upon. This facing or milling can be done with great accuracy and its omission on bearing surfaces is cause for rejection of the member.

When the erection starts the inspector should keep in mind the functions of the connections and the way the stress is carried from one member into another. This will put him in a position to check the work up in a practical manner. For instance, he will notice that some steel beams rest upon seats which were riveted up in the shop. The additional rivets are really for the purpose of holding the beam in place and not to take a load. Other connections will be directly from the beam through the connecting angles to the column or girder by means of rivets. It will readily be seen that the rivets in this last connection are very much more important and should be more carefully inspected than the field rivets in a seat connection.

The inspector should bear in mind that a rivet is supposed to hold by its shearing and bearing values, but that it also performs a very important function if tight, by holding the two surfaces together and producing a large frictional resistance between the plates. He should also remember that the process of riveting induces a certain amount of internal tension in the shank of the rivet and thereby renders the rivet unreliable for additional tensile strains, and, therefore, bolts with lock nuts should always be substituted for any rivets that are supposed to act in tension.

Having pointed out the essentials of having a tight rivet, the question is how to get it. It is absolutely necessary to inspect steel work before riveting and see that the holes in the plates are concentric, for if a rivet be driven with one-eighth inch eccentricity, it may be a very poor rivet, but it may be tight, and therefore impossible to detect after the riveting is complete. I would say that all differences of eccentricity of over one-sixty-fourth of an inch should be reamed, although this practice might be made less rigorous on unimportant rivets. The use of a drift pin to make the holes concentric by forcing action is to be condemned. In the same way the cutting of extra holes by means of an electric or other torch is to be severely condemned. Having inspected the joint and found the holes concentric, the riveting may proceed. If the rivet is tight and the head full, it should be passed, but if it is loose it should be cut out. Here again, the riveting should be closely watched, as a rivet may be inadequately tightened up by what is known as calking, which consists of the use of a hammer and chisel, wedging the rivet head. The rivet may have the fault of too short a stock and the heads will be flat. This should not be confused with heads which are purposely flattened or countersunk for clearance. Another method of ineffectually tightening the rivet head consists of raising the plate surface under the rivet by driving the rivet snap sideways against the plate. Hence where the plate has been injured or shows a ridge around the rivet the rivet should be cut out.

Cold-hammering of heads should never be allowed. It is easy to detect this because a smaller snap is used on a head when cold-hammered.

The testing of a loose rivet can best be done with a small hammer. Place the finger on the opposite head while striking. Also strike the rivet head up and then down and note if there is any vibration.

A small tile hammer with a personal die cut in the head by annealing it soft and hard again will serve the purpose of surely marking defective rivets.

Another duty of an inspector is to see that the size and weights of beams called for on the plans are furnished. Owing to the Bethlehem and standard shapes having a number of different weights, the flanges should be carefully scaled to detect any substitutes. Where a beam or girder rests upon a wall, care should be taken to see that it is amply supported by the masonry and anchored thereto.

Painting is a very important matter in the preservation of steel work, and all portions where paint has been removed by shipment should be repainted before erection. The field coat should be of different color than the shop coat.

Cast iron members should be carefully inspected for visible defects.

All cast iron columns should have at least two holes drilled in the column for the purpose of checking the thickness of the column. Often the core is displaced in pouring, rendering the column thinner on one side than the other. A discrepancy of more than twenty-five per cent. should be cause for rejection.

All bearing surfaces in cast iron should be milled. Columns which are crooked should be rejected.

The cast iron beam seats should slope down outwards to make the beam bear as close as possible to the column and eliminate flexure in the seat.

A double lug generally engages the web of a beam through which a single bolt is passed. On one job these bolts held the beams up off the seat and necessitated field changes.

All steel should be marked for identification in the field and the shop inspector's mark should also appear. The most intelligent field inspection can be made by a representative from the designer's office, as he will be able to follow the designer's intent.

The inspector should co-operate with the erector in safeguarding the structure from accidents during erection. He should see that the derrick base is secured from the horizontal kick of the boom in any direction. The steel carrying the derrick should be strong enough and have sufficient connections for the erection stresses involved. He should exert a check on dangerous practices, such as lifting too heavy a load for the strength or counter-ties of the derrick, booming out too far or the splicing of booms.

Guying and bracing of steel in the process of erection against wind-bracing is important. In this case it is well to remember that serious accidents have occurred through the shrinkage of guy ropes when wet. To sum up:

1. See that your steel is inspected by a competent bureau in the mill and shop.
2. See that your bases have a proper masonry contact.
3. See that columns bear directly on bases with full bearing; that columns bear directly on columns with full bearing and that all stiffeners are milled to bear.
4. See that the steel is repaired and straightened where injured during shipment.
5. See that no rivets are in tension.
6. See that all rivets are tight and driven in concentric holes.
7. Look out for a good two-coat paint job.
8. Be sure that beams have proper wall bearing.
9. Inspect cast iron for workmanship and flaws.
10. Safeguard the erection against accidents.