IMAGE EVALUATION TEST TARGET (MT-3)

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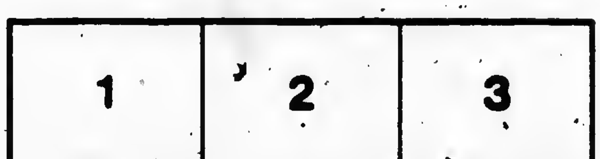
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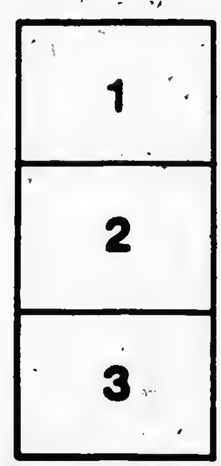
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AMIGAN

OOL WORKS

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CAPITAL, $1,000,000

The Hamilton Bridge Works Company
Limited

ENGINEERS, DESIGNERS AND CONTRACTORS

FOR

Railway Bridges, Railway Turntables, Electric Railway Bridges, Electric Railway Power Houses and Running Sheds, Highway Bridges, Buildings, Roofs, Structural Work of all kinds; Steel Towers for Waterworks, Railways and Observatories; Steel Poles for Telegraph, Telephone and Electric Power Transmission

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HAMILTON, CANADA

1909

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Announcement

SINCE our last catalogue was issued in 1890, many and great changes have taken place in the bridge and structural steel business and these changes are principally in designs of structures and in the improved facilities for the manufacture of steel and for the fabrication of same in the bridge shops and particularly in the enormous increase in the demand and use of such material, and in the following pages will be found examples of our work erected in every province, from the Atlantic to the Pacific, Bridges, Structures, etc. We have successfully completed over four thousand miscellaneous contracts in Canada. All large and many small manufacturing plants are now designed to use a maximum of steel and a minimum of timber or other building materials, and when combined with concrete for foundations, walls, etc., structures economical in cost are the result. A few years ago a steel roof or steel building was considered an expensive luxury and possibly a curiosity, now the reverse is the case. A few years ago the majority of highway bridges were built of wood, whereas, now steel is almost exclusively used. Several years ago the majority of steel bridges had wood floors resting on timber joists. A gradual improvement in construction took place and steel joists were introduced and after that the concrete floors so that now the almost universal practise is to use steel joists with concrete floors and to have all bridges designed for a reasonable concentrated load and in our opinion this is the only proper method to pursue as sooner or later it will be required that all bridges be covered with permanent floors of concrete or some other similar material as even at the present time timber is very expensive and very scarce and of poor quality. We state as our very decided opinion that all highway bridges built from now on should be designed for permanent floors and for concentrated loads of not less than 10 tons on two axles. It is not necessary that the bridges be covered at the time of construction with permanent floors as timber can be used in the meantime and the steel joists can be so arranged that the full life of the timber floor may be obtained and at some time in the future this floor may be replaced by a permanent one.

Such changes as above mentioned, together with the great increase that has taken place in the number of and additions to industrial plants generally in all parts of the country, the great increase in the mileage of existing railways and the building of new ones (both steam and electric) has created an enormous demand for steel structures of every sort and many times what it was some years ago, and to meet such demand we have entirely rebuilt and remodelled our works, and have added very largely to our capacity, which has been increased treble what it was five years ago.

We have pleasure in forwarding you this new catalogue which we have endeavored to make as comprehensive and complete as possible, and while it contains a large amount of information it by no means covers all the points in connection with the matters treated of. We have a large and experienced staff of engineers and we are willing and will be most glad at any time to give any information within our power to engineers, architects, builders, contractors, municipal officials or other interested parties in regard to any proposed structures they may have in view.

We acknowledge with gratitude the very liberal patronage accorded to us at all times and our entire efforts have been to strictly carry out every item of our agreements and by remodelling and adding to our works have endeavored to keep up with the demands of our customers. We endeavor to make our work a standard of excellence and claim to be the undisputed leaders in the steel highway bridge business in Canada, and for railway and building work we can serve you as favorably, promptly and efficiently as any of our competitors.

In order to meet the increasing demand of our merchant business we are carrying in stock at all times a large tonnage of sections, plates and bars to enable us to make prompt and quick shipments. We issue a regular stock list twice a month and are prepared to give manufacturers, wholesalers and others prices on various classes of material and covering any stated period of time. This proves to be a very satisfactory manner of doing busi[illegible] does away with many delays and numerous enquiries and saves considerable time and expense.

All these facts are presented as good reasons why we believe you should and will favor us with your patronage in the future.

We trust you will find time to look carefully through this catalogue and preserve it for future use.

Description of Works and Plant

OUR new works are located in the north-western portion of the city on the site the old ones have occupied for nearly forty years. They cover about eight acres with two thousand seven hundred and seventy feet street frontage. The main works are served by double track sidings into the shipping yards and the shops, and the stock yards are served by independent sidings on our own property. Our unloading and shipping facilities are unsurpassed in Canada, being served by four large steel electric travelling cranes, located in the unloading, sorting and shipping yards. See other pages for views of cranes and stockyards.

The works are operated by electricity, compressed air and natural gas throughout.

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INTERIOR VIEW MA

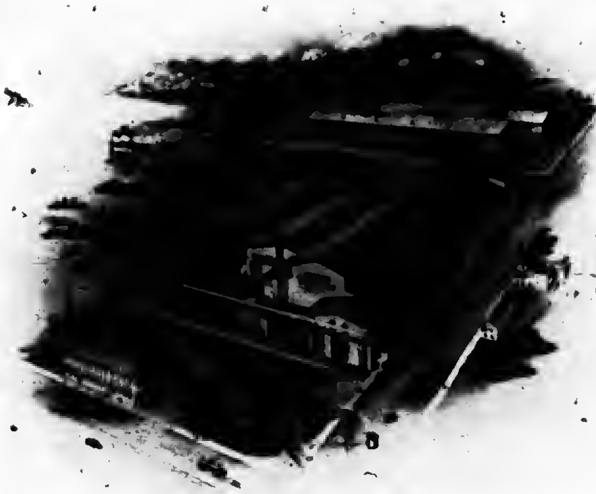
THE HAMILTON BRIDGE WO

BUILT OF STEEL CONCRETE AND GLASS SIZE, 465 FEET LONG B

NTERIOR VIEW MAIN SHOP

BRIDGE WORKS COMPANY, LIMITED

465 FEET LONG BY 190 FEET WIDE CAPACITY, 25,000 TONS, PER ANNUM



General View of Works of

THE HAMILTON BRIDGE WORKS COMPANY, LIMITED

The above illustration shows a portion of the Assembling Floor in the main Bridge Shop, and illustrates very clearly the method of handling material with Air Hoists and moving it backwards and forwards on steel roof trusses

The above illustration is another view of the Main Bridge Shops showing material ready to be sent out of the shops for shipment
The tracks run from the rear of the shop to the front where finished material is loaded on the cars by the shipping cranes.

Information, Estimates, Sketches and Plans

ARCHITECTS, Engineers and Contractors in preparing plans and estimates for various bridges and other structures often desire preliminary sketches, information and plans from the Bridge Companies giving general information and approximate prices for various classes of work. We have a large staff of Engineers and Estimaters, and are in a position to furnish our friends and customers with any advance or preliminary information they desire. We have the plans of all kinds of work executed by us in the past, and are usually able to pick out from our records any information of this kind required for almost any kind of work. We hope Engineers, Architects, and other interested parties will call upon us when they require information of this kind, and whether we have done business with you in the past or not we hope to do so in the future, and will give you any assistance we can.

We are always pleased to have visits from any parties interested in structural steel or bridge work, and we believe a trip to Hamilton would be well repaid by an examination of our works, and with interviews with our Engineers.

Tenders for Bridges

IN asking for tenders there is certain information which should be given, in order that bridge companies may be in a position to prepare their estimates properly and on a uniform basis. The following particulars should be given as fully as possible:

1—The specifications in accordance with which the bridge is to be erected.
2—The length of bridge or of each span from centre to centre of bearings, or from face to face of abutments or piers.
3—The clear width of roadway required.
4—The live loads for which the trusses and floor system are to be designed.
5—The kind of floor to be used.
6—The nearest railway stations, and length of haul to the site of the bridge.
7—The character of the river bed, depth of water, speed of current, and height from the bed of the river to the floor of the bridge.
8—The style of bridge to be erected, if there is any preference in respect to kind and height of trusses, riveted or pin connections.
9—If the bridge is skewed, the necessary angles made by center line of roadway with face of abutment should be given.
10—The number and size of piers, if any.
11—Number and width of foot walks, and kind of hand rails.
12—When the work is to be completed.
13—Time to which tenders will be received, and to whom they will be addressed.
14—State when and where tenders will be opened, and if the work will be awarded at the time tenders are opened, and if not, when it will be awarded.

It should be kept in mind that the contracts for bridges ought to be let at least three months before they are required to be completed!

It is possible in many instances to complete contract in considerably less time than this, but there may be delays in obtaining material, in manufacturing due to the crowded condition of the shops, in transit to destination, or due to weather conditions during erection, which should have consideration.

Riveted Warren Truss Highway Spans

THE illustration on the opposite page is that of a Warren Truss Span. This design is particularly well adapted for highway bridges of medium spans in lengths from 30' to 105'. The number of panels will, of course, vary with the length of span.

This design is economical in first cost, and requires little or no attention for repairs.

It is an all riveted bridge without pins or nuts, and with reasonable attention will last longer than any other type of bridge that can be used for highway purposes.

This illustration is taken from a span erected by us during the summer of 1908, and we would call particular attention to our method of sway bracing, which we have no hesitation in claiming is the best on the market. With this brace we claim it is next to impossible for the trusses to sway, and this is not the case with ordinary single bracing. It is swaying of this kind that very shortly weakens the carrying capacity of the bridge, and in time causes the rivets to become loose and their heads to break off.

The cut shows the bridge with steel lattice railings, but tubular railings of gas pipe can be used and is somewhat less expensive.

Page 1[illegible]

Riveted Warren Truss Highway Spans

THE illustration on the opposite page is also a riveted Warren Truss Span. This is the same type of bridge as illustrated on page 13, and we draw attention to the fact that these spans can be designed to have steel lattice railings, or two or more lines of pipe railings on each truss. Also if particular attention is paid to the illustrations it will be seen that the roadway is supported on steel joists, and on each side of the floor are steel curbs. Concrete curbs can be formed on the outer edges of the roadway which would do away with the steel, but as these are liable to break or crack away, it seems desirable to use steel although at slightly greater expense.

The above illustration shows three Warren Truss Steel Highway Spans, built by us near London, Ont., and known as Plover Mills Bridge.

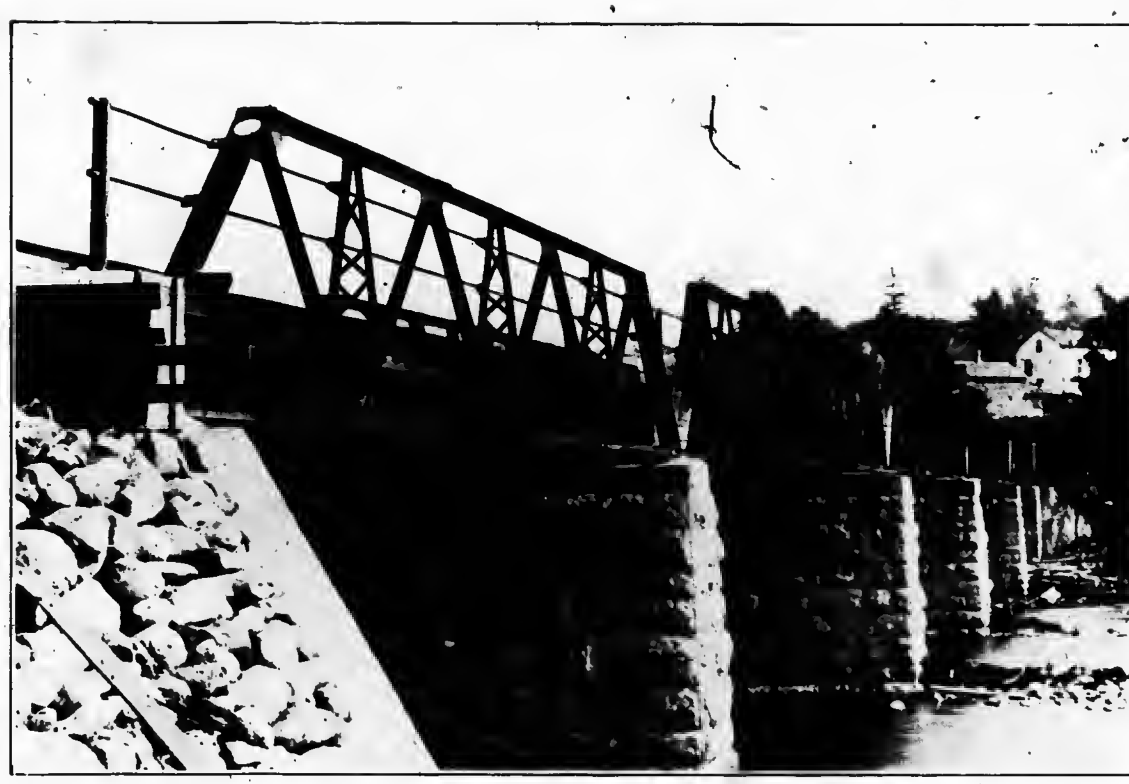
The above illustration is another view of the three steel bridge spans in Plover Mills Bridge, erected by us in 1906, in the County of Middlsees, near the City of London.

Concrete Floors

THE cut on the opposite page illustrates Glen Morris Bridge of six spans, built by us in 1908, for the County of Brant. This illustration shows what we believe to be the longest continuous concrete floor on any highway bridge in Canada. The use of concrete floors is now almost universal, and we strongly recommend every municipality to have their bridges built so that concrete floors may be used at the time the bridge is erected, or so arranged that concrete floors may be put on any time in the future. It is a great mistake to build bridges of such light capacity that timber floors must be used forever, or such bridges will require to be reinforced or taken down altogether There are several very good specifications for concrete floors, and in particular the Ontario Government specification is recommended for your consideration. It has also become the custom of many municipalities in calling for tenders for highway bridges to make it a part of the agreement that the Bridge Company shall put on the concrete floor. We consider this a mistake for the reason that most bridge companies' workmen know little regarding concrete, and are not familiar with the handling of same, and it would be wise to make a separate contract for floors, and preferably the man who takes the contract for the sub-structure should also take the contract for the concrete floor. We believe that you could get concrete floors cheaper if built by the man who builds the sub-structure for the reason that he will have all of his material there and plant for handling same, and also having experienced men he should certainly be able to do a better job for less money and in less time than the inexperienced men of the Bridge Company. The cost of 6" reinforced concrete floors varies from 25 cents to 40 cents per square foot according to location of bridge site.

Riveted Warren Truss Highway Spans

THE cut on the opposite page is another illustration of the Glen Morris Bridge built by us in the Summer of 1908, for the County of Brant and is a good illustration of a fine highway bridge. The total over all length of the floor of this bridge is 460' and the clear width of the roadway 16'. The bridge consists of six spans, one each 60', 70' and 75', and three 85' each. This bridge was built to comply with the Ontario Government specifications and we believe it to be one of the very best highway bridges in Ontario.



The above is an illustration of steel Warren Truss, span 100' long, erected by us in the Town of Petrolia three years ago. This is a good illustration of another long span Highway bridge built as a low truss. In this case, it was desired to have a low truss to permit the moving and handling of oil derricks without interference with overhead bracing.

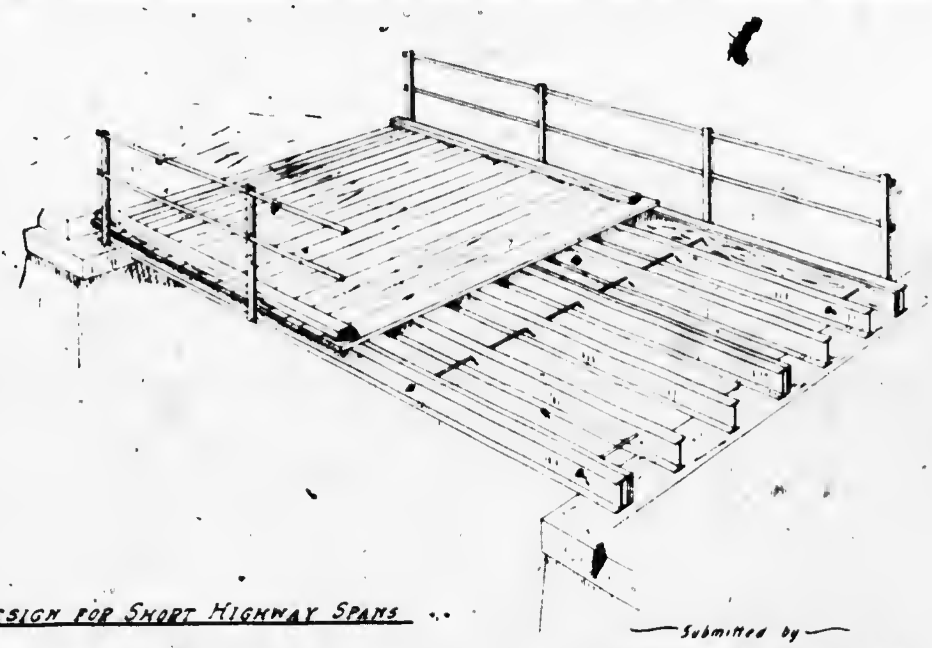
The illustration shows a 90' span erected by us in Summer of 1908, at Beachville, Ont. (and a duplicate also erected at same time for Trafalgar Township). This is a heavy span with concrete floor, lattice railings and first-class in every respect.

Riveted Warren Truss Highway Spans

THE cut on the opposite page is one which appeared in our previous catalogue issued several years ago, and represents the simplest and cheapest steel bridge that can be erected. You will note that it has wooden joists and wooden rails, and also that it is placed on temporary wooden abutments. While we do not by any means approve of such a cheap structure as this, we are illustrating it, as we seek to point out that if you are limited to a certain sum of money, you will see that you can get a steel structure which can be placed on almost any kind of temporary abutments, and if sufficient attention is paid to the con[illegible]tion of these temporary abutments it will last a reasonable length of time, a[illegible] more money is available with which to build more permane[illegible]tmen[illegible] a very simple matter to jack the bridge up in the air and n[illegible] to inter[illegible] traffic at all while permanent abutments are being put in place.

Beam Spans

THE illustration o[illegible]pposite page shows a design for short span highway bridge and of [illegible] we have built a great number during the past five years. The style shown is suitable for bridges in lengths from five feet up to thirty-five feet, the type for all lengths being exactly the same but the number of beams, depths and weights of same being governed by the length of spans, width of roadway, and the load to be carried. The illustration shows a wood floor, but the majority of these spans are now built to carry concrete floors, and in a great many cases the concrete is applied at once, but in other cases, a temporary timber floor is used in the meantime as it is economical. By referring to page No. 28 you will note a concrete floor of another type which is equally applicable to either.

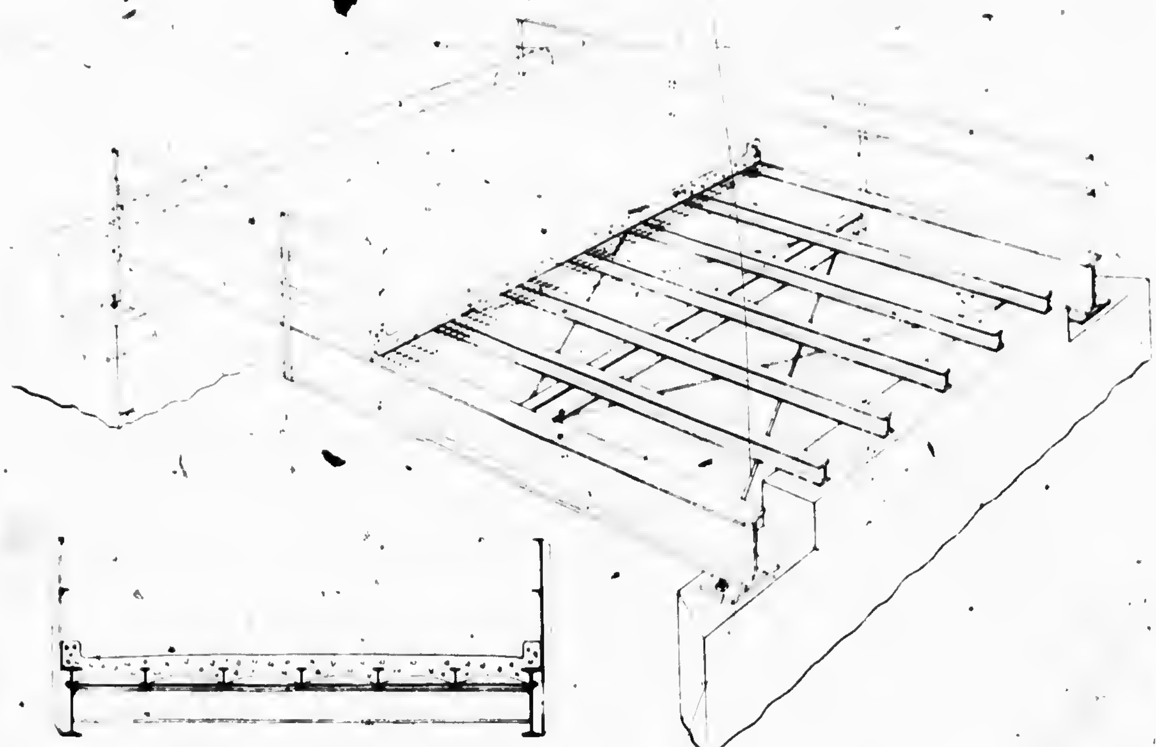


DESIGN FOR SHORT HIGHWAY SPANS

—Submitted by—
The Hamilton Bridge Works Co Ltd
Hamilton Canada

Beam Spans

ON the opposite page, we illustrate another type of short span highway bridge. This bridge can be designed for either wood or concrete floors, but we strongly advise designing it heavy enough for concrete floors, although wood floors can be used in the meantime. This type of bridge is suitable for spans from 20' to 40', and the design remains practically as shown in illustration, except for spans up to say 30'. When one floor beam only may be necessary; but in longer spans it is more economical to use two floor beams. The size of the main girders and floor beams and number of joists is naturally governed by the length of spans, width of roadway and loads to be carried. The plan for the bridge shows the ordinary reinforced concrete floor which we recommend putting on the bridge immediately after it is erected, but wood floor can be used in the meantime, if desired. We also show a cross section of a similar bridge illustrating concrete floors placed on corrugated steel troughs. Some Engineers and Officials of some Municipalities prefer this style of floor rather than the usual reinforced concrete slabs shown on plan for the bridge. It is immaterial to us as to the design of floor used, but from an engineering point of view, we consider the concrete slabs superior to arches.



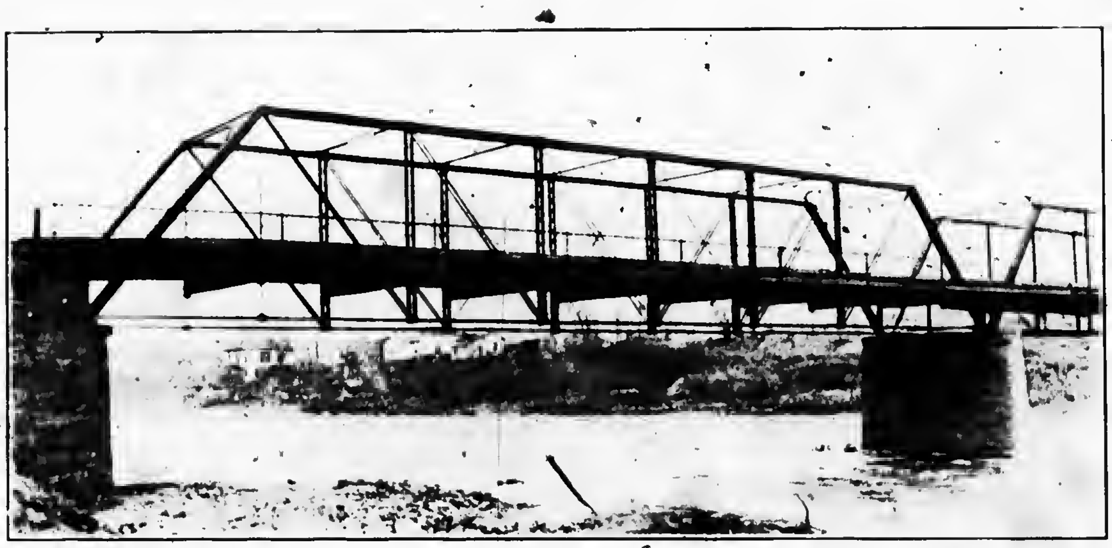
Riveted High Truss Spans

THE illustration shown on the opposite page is from a photograph of a highway span 140', recently built by us in the County of Oxford, and is the third span built in two years from the same plans and specifications. This bridge was designed for usual highway traffic, and has reinforced concrete floor and steel lattice railings, and is an excellent illustration of a first-class highway bridge at a reasonable cost. Bridges of this style are built in lengths from 110' to 250', the only difference in designing being in the number of panels and increase weight and size of metal. We strongly recommend this bridge as being first-class in design and economical in cost.

Riveted High Truss Spans

THE illustration shown on the opposite page is taken from a photograph of two spans recently furnished by us in Eastern Ontario and is known as the riveted Pratt truss type, and is of the same outline as the old-time pin connected spans. This type of design is recommended for high truss spans in lengths of 80 to 120' and makes a first-class bridge and is neat and pleasing in appearance and economical in cost. It is possible to build these spans in greater lengths than 120' and it sometimes becomes a question as to whether this type of design is more economical for spans say up to 150' than the type shown on page No. 31. Very often it is a question of preference on the part of the engineer or commissioners in charge of the work as to whether this design will be limited to 120' and for spans over that length to issue a design as illustrated on page No. 31.

The above illustration shows a highway span recently erected by us, and is the standard type of Through Riveted Spans, where high trusses from 90' to 120' are required. This design is economical in cost and pleasing in appearance.



The above illustration shows a span recently built by us in the Town of Paris. This span was to replace one washed away in a flood. The photograph shows this bridge with the floor located several feet above the bottom chord. In the original design it was evidently found economical to do this, as there was not sufficient head room for a deck span and the additional cost of masonry to make an ordinary through span would have been considerable.

The illustration shows two 150' riveted lattice spans erected by us some time ago for the Township of Woolwich, in the County of Waterloo, and is a good illustration of a first-class highway bridge with concrete floor.

The illustration shows a Steel Arch, erected by us some years ago over Victoria Arm on Vancouver Island.

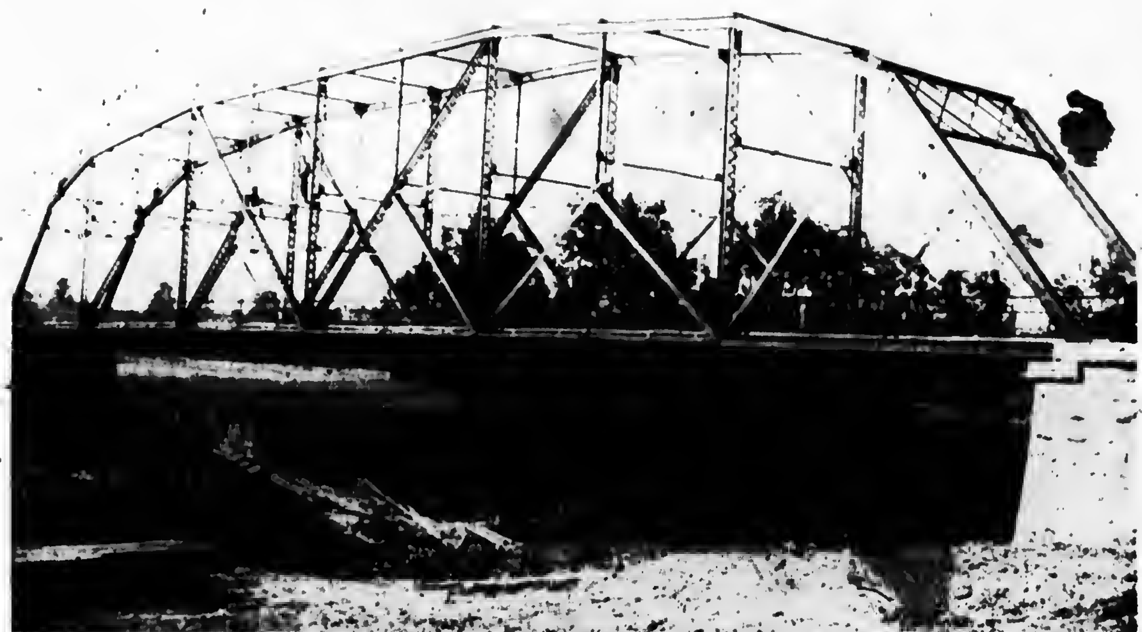
The illustration shown above is a 200' span erected by us for the County of Elgin three years ago, and is similar in design to the illustration shown on page No. 39.

The illustration shown above is for a 240' span built by us for the Counties of Elgin and Middlesex four years ago, and is similar to design shown on page No. 38.

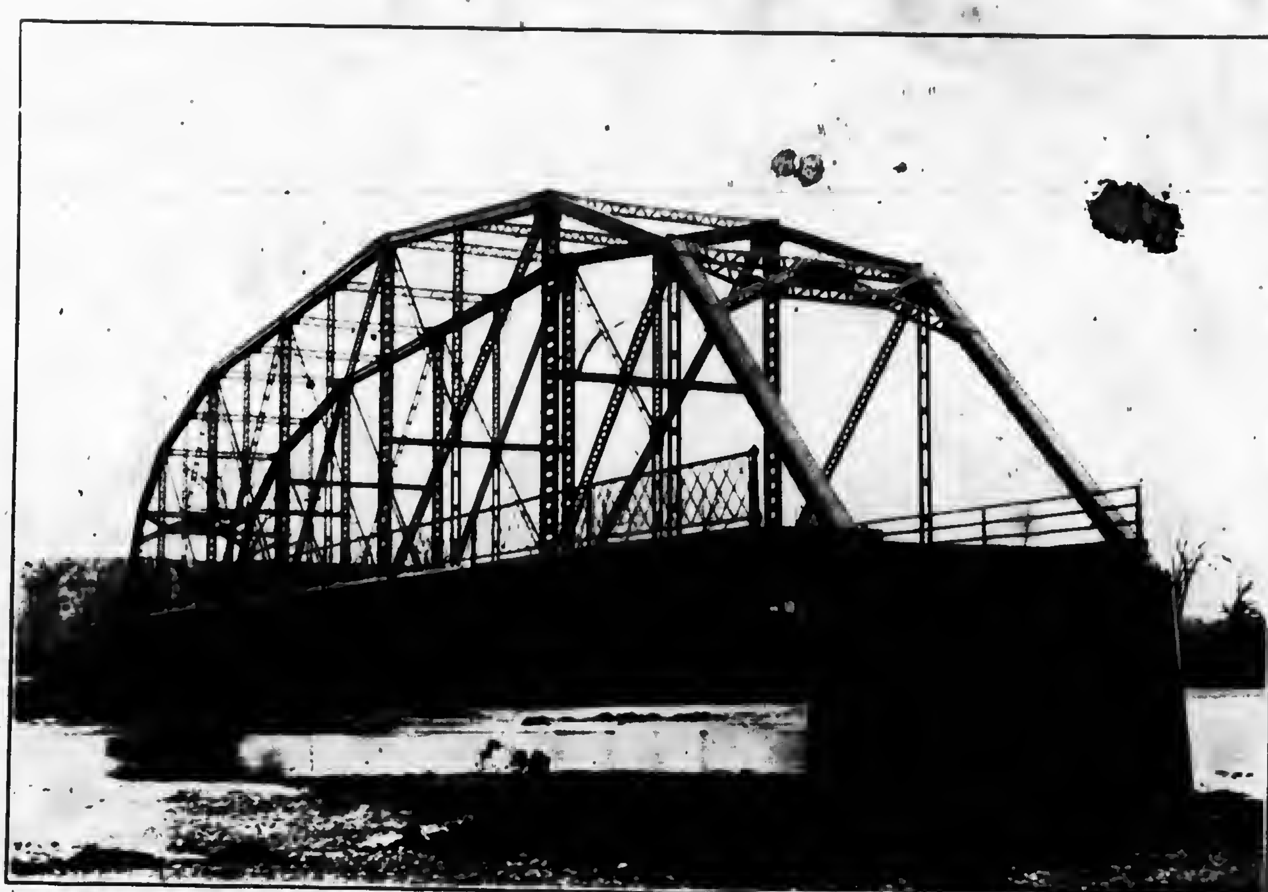
The above illustration shows the steel bridge built by us several years ago for the Government of the North-West Territories, and is over the Belly River at Lethbridge. It consists of four 175' Pin Connected Spans, and two 80' Riveted Warren Truss spans all with a 16' roadway. On page No. 12 will be found an illustration, showing the very handsome concrete piers used for this bridge.

The above illustration shows a bridge built by us for the North-West Government several years ago, across the Old Man River at McLeod. It consists of two 175' Pin Connected Spans and two 80' Riveted Warren Truss Spans, all with a 16' roadway. On page No. 42 is an illustration showing the very handsome concrete piers used for Belly River, at Lethbridge, and we understand the substructure for McLeod bridge is practically the same.

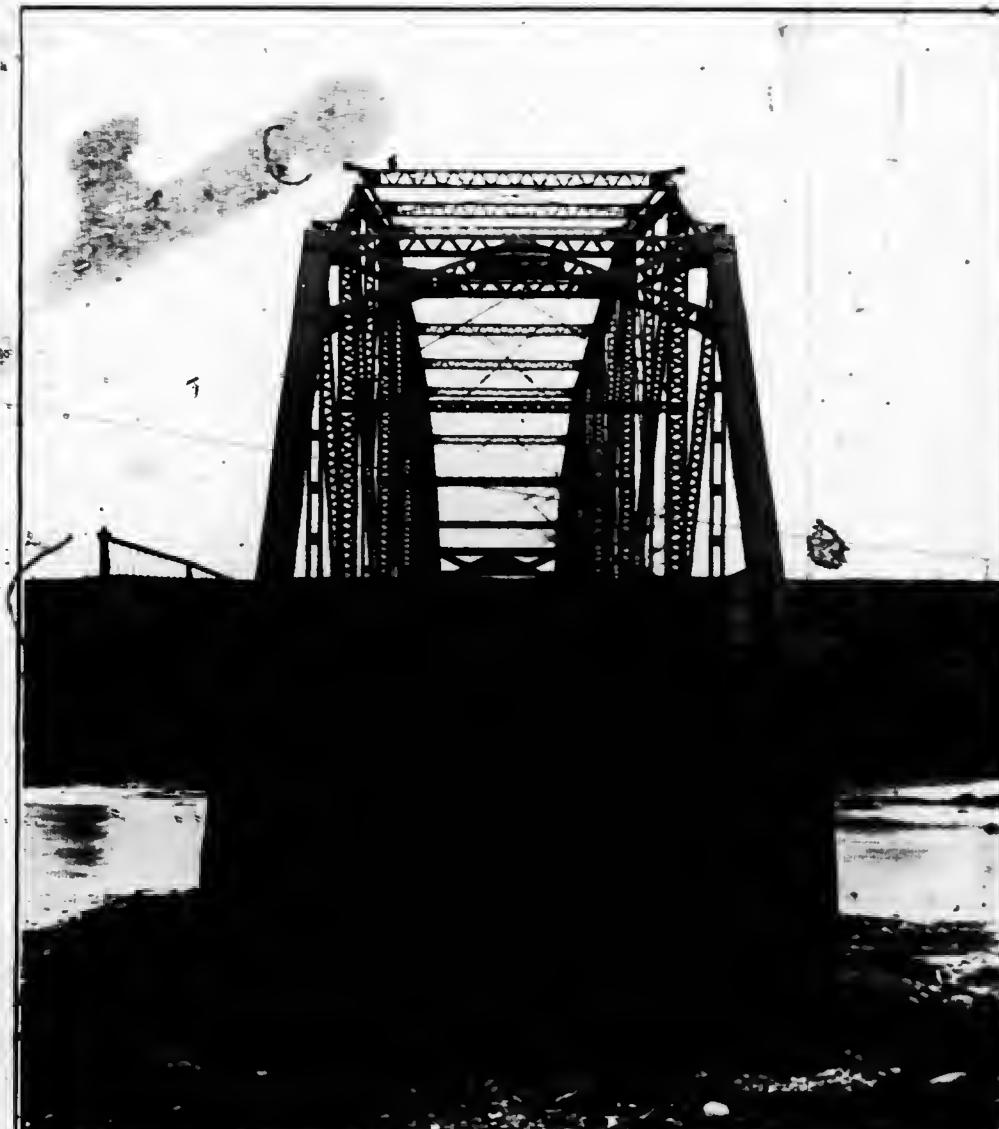
The above illustration shows the very handsome and substantial concrete substructure used for Old Man River Bridge at MacLeod and similar substructure was used for Belly River Bridge, at Lethbridge. The superstructure for these spans (built by us) are shown on pages No. 40 and 41.



The above illustration shows a pin connected bridge of long span and light design. There are not many bridges of this type built now as the design shown on page No. 39 is preferable.



This cut illustrates a bridge recently built by us and is a single pin connected span 252' in length, with a 6' sidewalk on one side and an 18' roadway
It will be noticed this bridge rests on steel cylinder substructure, and while we are not generally in favor of substructures
of this type, there are at times, special conditions and circumstances which would warrant using it.
We much prefer stone or concrete substructures of proper design.



The above illustration is an end view of the same bridge shown on page 44.

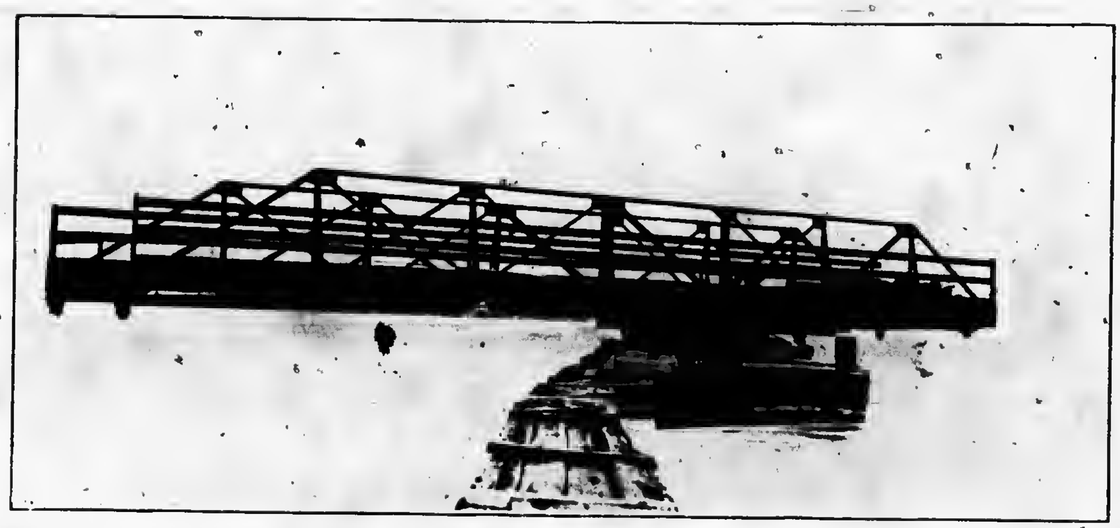
Queen Street Bridge, over River Don, Toronto. Span 130', roadway 42' and two sidewalks each 10'. A heavy bridge for city traffic and provides for double track electric railway, roadway and sidewalks covered with concrete.

Swing Bridges

THE requirements for Swing Bridges are not very great in Canada, being confined principally to the various canals in different parts of the country. Occasionally, however, it is necessary for a city or rural municipality to build a Swing Bridge, and as almost every case requires a peculiar design of its own, it is rather difficult to illustrate so many different types, but those shown on the following pages will probably be of interest.

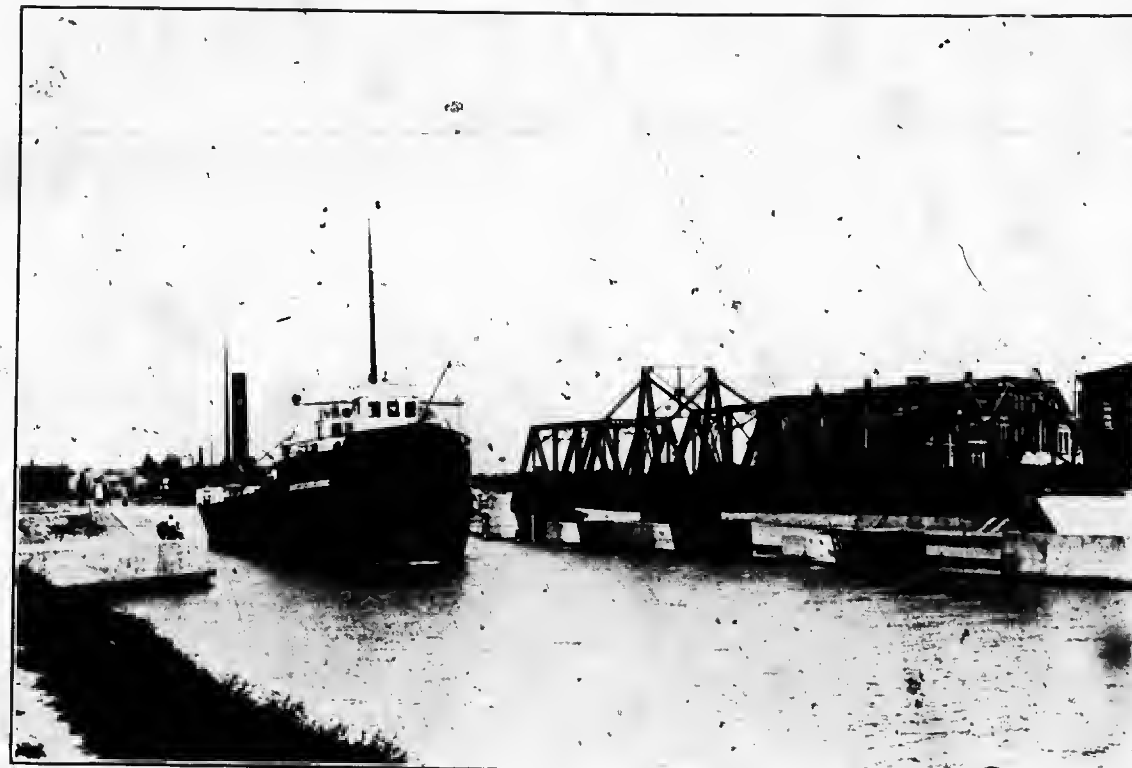
The above cut illustrates the Dominion Government Standard Highway Swing Bridges used at various points on the Trent Valley Canal. The bridge illustrated was recently completed by us at Glen Miller, on the Trenton section of this canal, and is one of eleven similar spans erected at different points on the Simcoe-Balsam Lake Division and Holland River and Trenton sections of this canal.

This cut illustrates a light highway swing bridge erected by us at Kemptville, some years ago, and is one of several similar spans erected in different parts of the country.



This cut illustrates a light highway swing bridge erected by us, several years ago, at Chemong, being part of the floating bridge at that point, and is very similar in design to that shown on page No. 49, with the exception that overhead bracing is omitted. This makes a very good type of light highway swing.

This cut illustrates a bob tail swing bridge built by us over the Welland Canal at the Town of Welland several years ago and is a very good illustration of Government practice in canal swing bridges.
This is known as Alexandra Bridge.



This cut shows another view of Alexandra swing bridge illustrated on page 51, showing the bridge open to permit passage of steam barge.

The above cut illustrates a bob tail highway swing bridge erected by us on the Welland Canal at Humberstone.

This cut illustrates an equal arm swing bridge built by us several years ago over the Welland Canal at Niagara Street, St. Catharines, and is a very good illustration of the latest Government practice in swing bridges. It will be noted this bridge has a drop at each end of the suspended arms, and provision is made in the floor system for double track electric railway.

This illustration shows the steel work of Hawkesbury bridge in course of erection. This structure is on the line of the Canadian Northern Railway over the Ottawa River, near Hawkesbury, Ont., and consists of seven pin connected deck spans each 206' long from centre to centre.

THE illustration on the opposite page shows our method of erection in re-building trestles on the Canadian Pacific Railway near Toronto, Ont. The work consisted of doubling up the bracing and struts in the towers, and replacing old girders with new. In one trestle, we had ten towers and two rocker bents, with an average height of 110', and eleven 30' girders, six 40' girders, and six 60' girders. Another trestle had eleven towers of an average height of 92', and had thirteen 30' girders, six 40' girders, and three 60' girders. Another trestle had five towers with an average height of 75' and had seven 30' girders, and three 60' girders. Another trestle had 4 towers and two bents of an average height of 83', and had five 30' girders, four 40' girders, and one 60' girder.

The taking out of the old girders and placing of the new was done entirely with our steel erection car, all girders being riveted up complete and the new ones dropped in place as shown. All work of cutting out the rivets in the towers, drilling new holes and replacing with new rivets, and all riveting up of new girders was performed with compressed air.

Canadian Pacific Railway Trestle over River Don, near Toronto, Ont.

The above illustration shows a single lattice girder 130' span riveted up complete and shipped to its destination where it was connected and riveted up with another girder and placed in position complete.

Centre Girder o[illegible] Street Subway, Toronto, on the line of the Grand Trunk Railway System.
[illegible] 5" over all ; Weight 87,000 lbs.

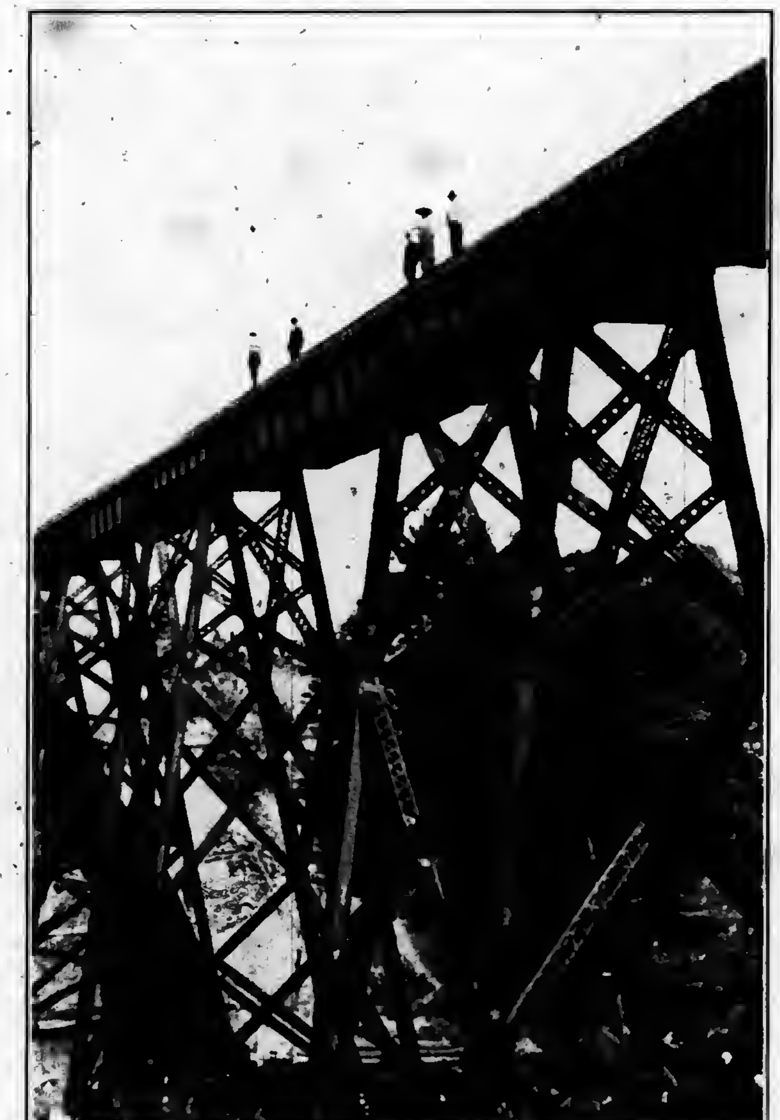
Steel Bridge over the River Humber, near Toronto, Ont., on the line of the Canadian Pacific Railway. Three spans of 157' each.

Single Track Through Pin Connected Span, carrying the line of the Grand Trunk Railway over the Humber River.
Span, 202'; weight 450,000.

This illustration shows the two main girders for Government Street Bridge, on the line of the Intercolonial Railway, near Levis, Quebec, and erected by us several years ago. This bridge was 112' long over all, and is an exceptionally heavy structure. The total weight of the bridge was about 260,000 lbs. and the weight of each individual girder about 80,000 lbs., and we believe these to be among the heaviest girders ever handled in one piece in Canada.

This illustration shows a peculiar condition, and it is not likely a similar condition exists anywhere else in the world. In a very short distance there are no less than five bridges, all so close together that it would be almost possible to throw a stone from any one bridge to any other one. The large arch span in the fore-ground is known as the High Level Bridge, and carries the main highway over the Desjardines Canal. Immediately under and crossing it diagonally is the main line of the Canadian Pacific Railway, between Hamilton and Toronto, and standing on that bridge are four cars loaded with one of the Lattice Girders for 150' span which was later erected on the main line of the Canadian Pacific Railway, at Streetsville, a few miles west of Toronto. In the distance will be seen a plate girder span, carrying the double tracks of the main line of the Grand Trunk Railway, between Hamilton and Toronto. By looking closely at the illustration and looking through the members of the Streetsville Girder, the top chords and upper portions of the end posts and verticals of an old highway bridge may be seen. This cut has been illustrated in several of the leading Engineering papers, and it is admitted by all that this is a unique illustration so far as bridges are concerned.

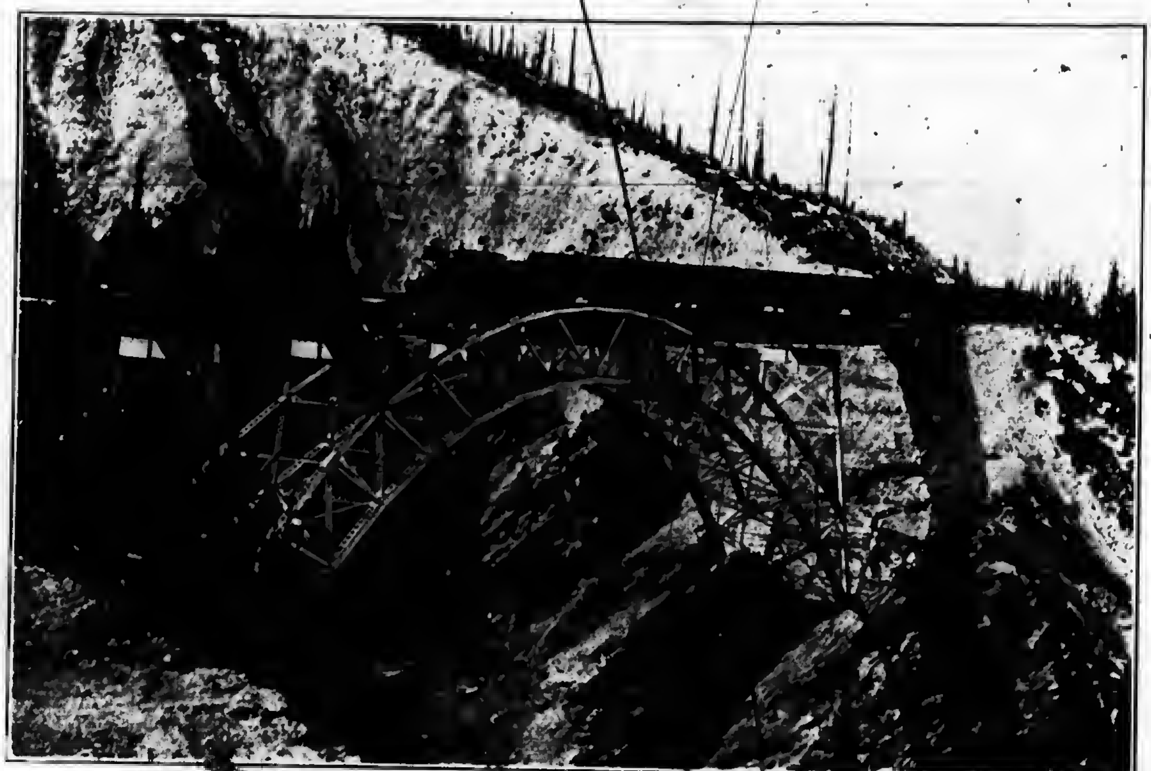
Steel Plate Girder Double Track Skew Crossing over Desjardins Canal, Hamilton, on the Toronto, Hamilton & Buffalo Railway. Length over all, 219'; weight 475,000 pounds.



The above cut illustrates a steel trestle on the Port Burwell Branch of the Canadian Pacific Railway erected by us three years ago. This is a very good illustration of recent practice in the building of bridges of this kind The work consists of five steel towers, the greatest height of which is 76', and the girders are made of five spans each 30', four spans each 40', and three spans each 60'.

The above illustration represents a bridge on the line of the Canadian Pacific Railway at Aroostook Junction, N. B. This was a case in which our contract covered the removal of four through plate girder steel spans and replacing three of them with deck plate girder spans and the removal of the fourth to the far end of the bridge, and also putting in several additional girders.

The above cut illustrates a bridge on the main line of the Canadian Pacific Railway, near Weston, Ont. The original structure consisted of wooden spans, and our contract covered the removal of the old work and the placing of the new without interruption of traffic.



This cut illustrates one of the largest single span Arch Bridges in the world, and was built by us on the line of the Canadian Pacific Railway over Stoney Creek, in the Selkirk Range of the Rocky Mountains. It will be seen that the work consists of a double ring arch span 336' long, with approach span of plate girders, making a total length of 483'. The rise of the arch is 100'. The weight of the steel in the structure was about 1,500,000 pounds.

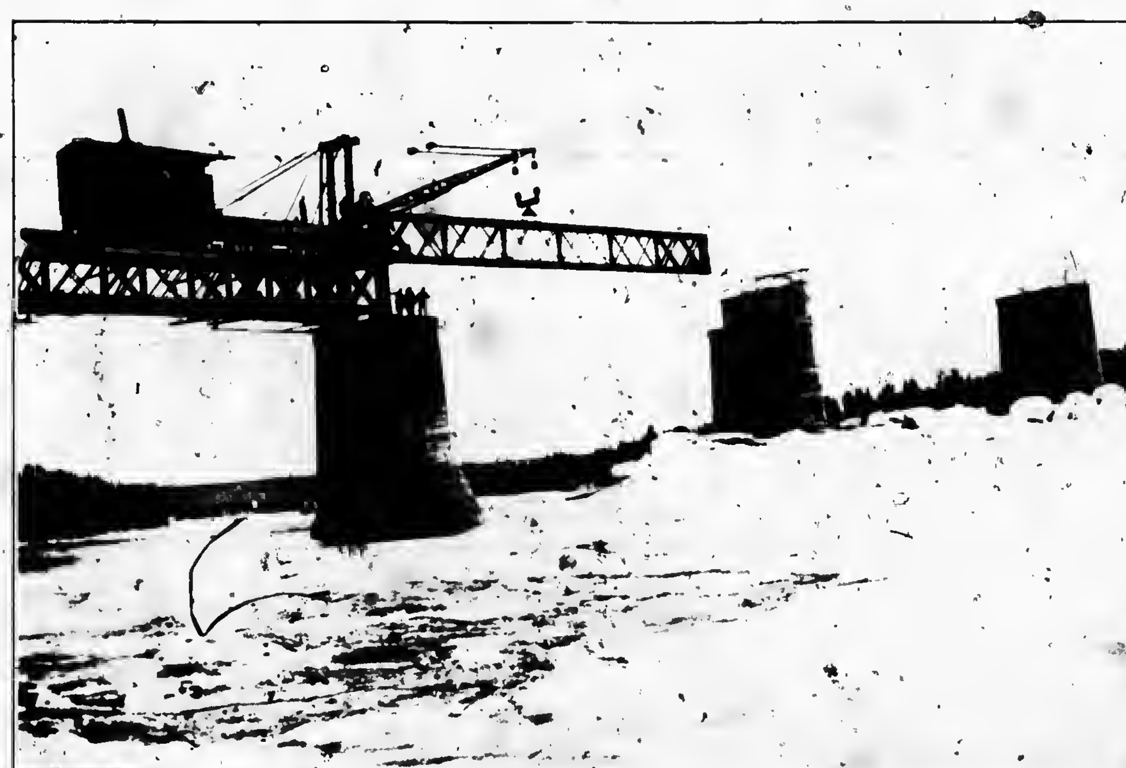
This cut illustrates a steel viaduct or trestle bridge on the line of the Hamilton Radial Railway at Oakville, Ont., and is a fine example of Electric Railway Bridge work. The structure has provision made for double track electric lines and has a sidewalk on one side.

THE cut on the opposite page illustrates a portion of the erection of large bridge over the gorge of the St. Maurice River at Shawinigan Falls, Province of Quebec, and erected on the line of the St. Maurice Valley Railway, which is operated by the Canadian Pacific Railway. This work consists of two 150' spans, one end of each resting on concrete piers and the other ends on a steel bent 90' high. As well as this, there are two 60' deck plate girder approach spans at one end, and a similar approach span at the opposite end. The first 150' deck lattice span was erected on falsework as shown, and the second span was erected as a cantilever, also as shown. This work was erected under very great difficulties by reason of the intense cold and the heavy and frequent falls of snow; and owing to the limited time allowed in which to complete the work, it was necessary to have day and night forces for several weeks, and the bridge was completed within a few hours of the necessary time to enable the Railway Company to earn the subsidy which had been voted for the line under certain conditions. This bridge is one of several bridges erected by us on the same line, one of which was at Les Gres Crossing, consisting of seven 60' deck lattice spans, one 200' through pin connected span and two 140' riveted through spans. Another interesting bridge erected by us on this railway was a 120' through plate girder span, which is probably one of the largest spans of this kind ever built in Canada.

Gorge Bridge, Shawinigan Falls, Que.

THE illustration on the opposite page shows a portion of the erection of Seguin Viaduct on the Toronto-Sudbury branch of the Canadian Pacific Railway at Parry Sound, which is claimed to be one of the largest railway bridge structures in Ontario, and is undoubtedly one of the best steel structures to be found in America. The arrangement and classification of spans is peculiar, owing to the unusual conditions of the location, it being necessary to cross two highways, one steam railway, and the Seguin River, and owing to the height of the structure, long approaches were required at each end. The structure consists of 26 spans of various lengths, made up of 22 deck plate girder spans, two 125' deck lattice spans, two 165' deck lattice spans over the river. The spans rest on ten steel towers varying in height from 28' to [illegible], and the whole structure is supported on 40 pedestal piers, two abutments and four large piers. The approximate height from the river bed to the top of the steel is about 120' and the weight of metal in the structure is about 3,500,000 pounds. An interesting fact in connection with erecting this bridge is that 20 spans out of 26 were placed in position with steel erection car without falsework or scaffolding of any kind. Two 125' and two 165' deck lattice spans were erected in sections with the steel car as shown on the illustration, two 125' spans and one 165' span being erected from falsework in the usual manner, and the other 165' span was erected as a cantilever without the use of falsework. The total length of the bridge is about 1,700'.

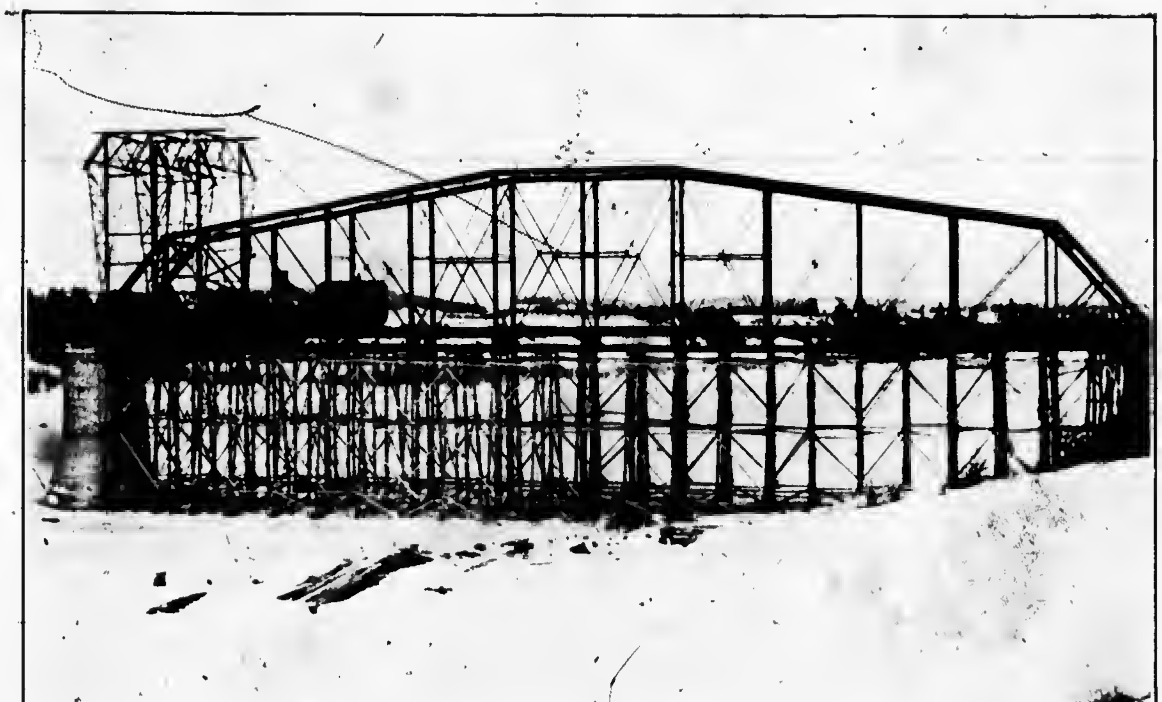
Seguin Viaduct, Parry Sound, Ont.



The above cut is an illustration showing steel erection car placing 100' deck lattice girders in Canadian Pacific Railway Bridge at Grand Falls, N. B., being part lot of four deck plate girders, four through girders and one 325' span.

The above photograph also shows a portion of the Canadian Pacific Railway Bridge at Grand Falls, N.B., showing the 25' span connected and the falsework removed. Also shows steel erection car placing the second girder of the first 100' deck lattice span. The steel in this span erected in 12 days.

The above cut is another illustration of Canadian Pacific Railway Bridge at Grand Falls, N. B., showing the 325' span connected and the falsework and traveller still in place.



The above is another illustration of Canadian Pacific Railway Bridge at Grand Falls, N. B., showing 325' span connected and with falsework and traveller still in place. This span is a part lot of four, 100' deck lattice spans, four 100' through lattice spans and the 325' pin connected span erected over the St. John River. Owing to the lateness of the season and the liability of the river breaking up early in the spring, it was necessary to make the quickest possible progress on this work. The span weighs approximately 1,000,000 pounds, and the erection of the steel was started on the 5th day of March and the last pin or connection made on the 17th day of March, 1908, being 12 days for the work.

The above is an illustration of one of the several bridges built by us on the Toronto-Sudbury Branch of the Canadian Pacific Railway. The illustration shows our steel erection car placing the second girder of the 90' span.

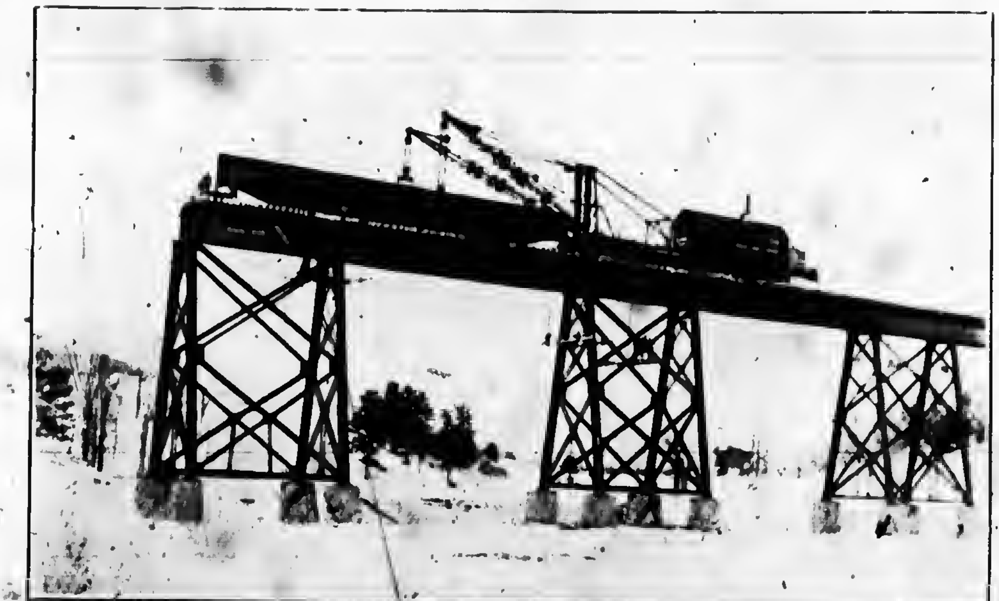
The above cut illustrates steel trestle built by us for the National Portland Cement Company, at Durham, Ontario, and was part of our general contract for steel buildings complete for this plant.

THE illustration on the opposite page shows a portion of the steel superstructure of the Canadian Northern Railway over the Saskatchewan River at Prince Albert, Sask. The bridge consists of five 150' single track through riveted spans and one 230' swing span, and on each side of the bridge there is provided a 12' roadway for vehicle traffic. The cut shows three of the spans erected and partly assembled. Under ordinary conditions this would be a comparitively simple piece of work, but owing to the fact that the conditions necessitated this bridge being erected during the winter time, the work was very difficult and expensive. For weeks and even months at a time the temperature was very severe, for a great portion of the time being 30 below zero and going as low as 50 and 60 degrees below zero.

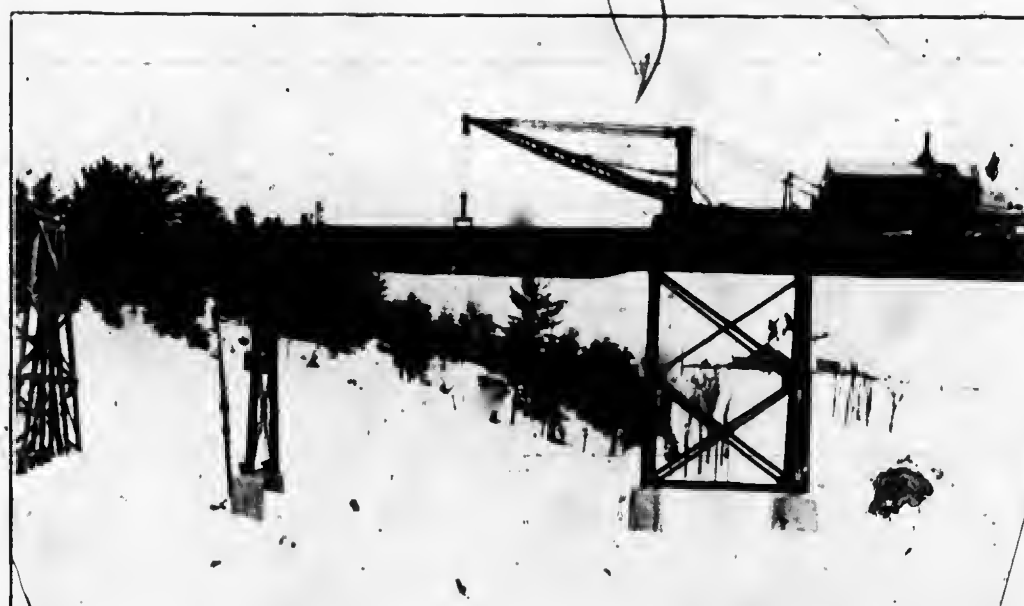
Canadian Northern Railway Bridge, Prince Albert, Sask.

The above cut shows a portion of Canadian Pacific Railway Bridge at Upper Woodstock, N. B., and the conditions show the difficulty frequently met with in erecting a new structure to replace an old one and at the same time not to interfere with existing traffic and the regular running of trains.

The above photo is another illustration of Canadian Pacific Railway Bridge, at Upper Woodstock, N. B., and shows the method of placing falsework on which to erect the new steel structure. It will be seen that our steel erection car is not only used in placing long and heavy girders but is also adapted for handling timber, etc., in the placing and building of falsework.

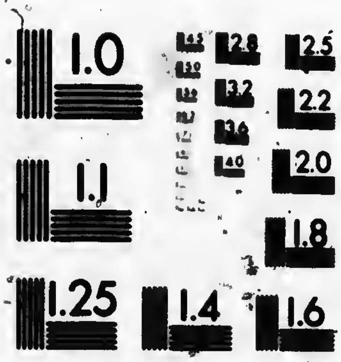


The above photo is an illustration of Green's Creek Viaduct, on the Canadian Northern Ontario Railway, about six miles from Ottawa, Ont., and shows our steel erection car carrying out 80' girders to drop into place.



The above photograph is an illustration of steel erection car placing 80' girders in Green's Creek Viaduct, on the Canadian Northern Ontario Railway, near Ottawa, Ont.

IMAGE EVALUATION
TEST TARGET (MT-3)

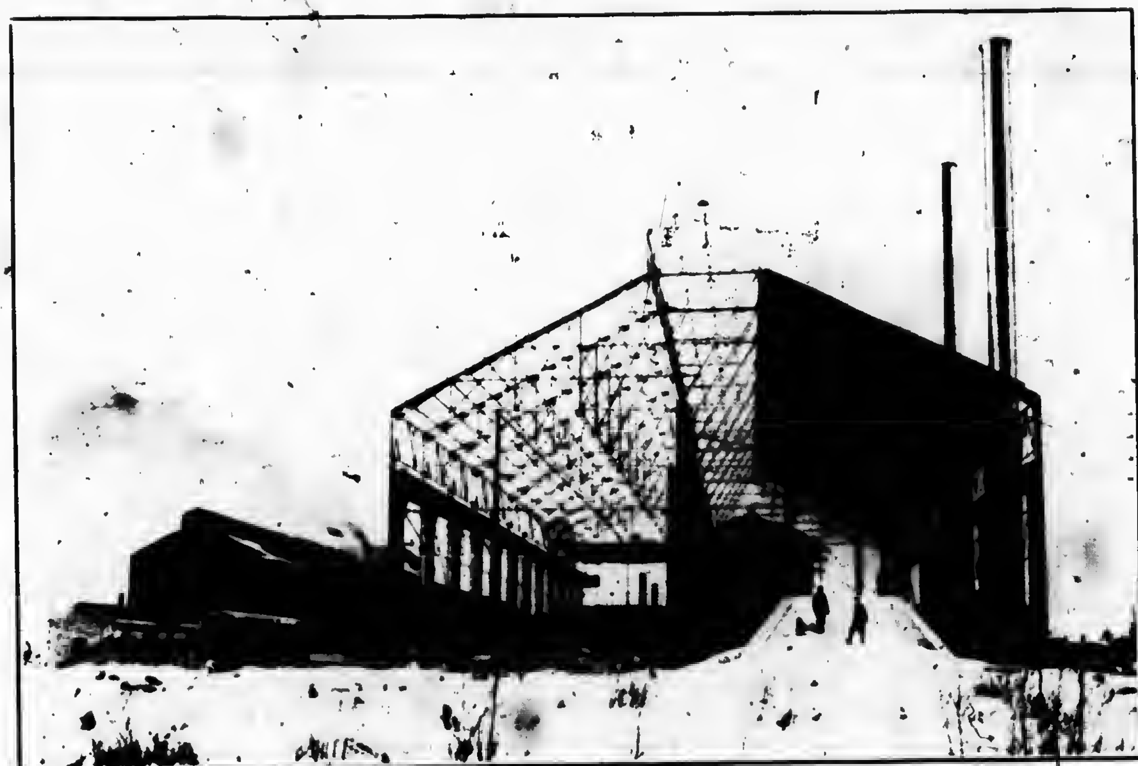


6"

The above photo shows a large portion of Green's Creek Viaduct on the Canadian Northern Ontario Railway, about six miles from Ottawa, Ont., which work was completed by us during the months of January and February, 1909. This work consists of five deck plate girders each 30' long, three deck plate girders each 60' long, and one 80' deck plate girder, all resting on five steel towers each about 50' high. All this work erected with steel derrick car No. 6, no falsework whatever being used.

The above cut shows the structural steel built by us for Power House for the Canadian Niagara Power Company, Niagara Falls, Ont. Our contracts with them covered several of the decks in the wheel pit as well as transformer house and other work in connection with this plant.

The above cut illustrates structural steel of Machine Shop for the Canada Foundry Company, at Toronto, being a part of the contract we had for several other buildings in connection with this plant.

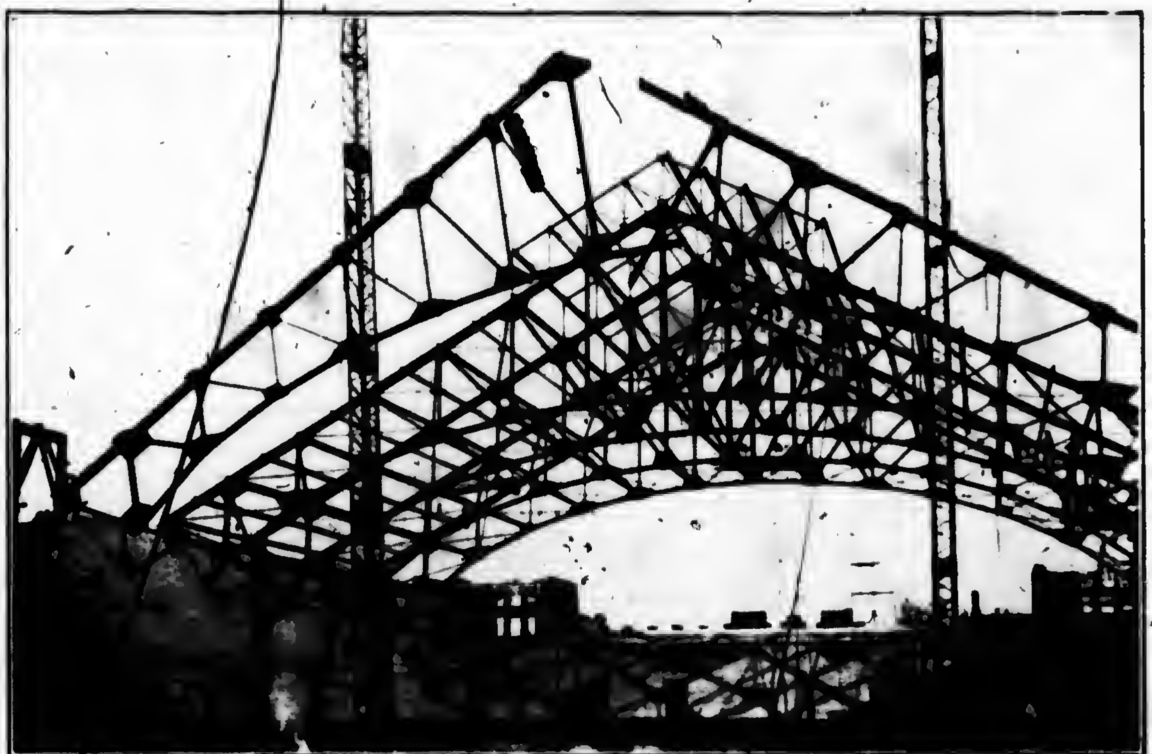


The above cut illustrates structural steel for Open Hearth Building for the Lake Superior Corporation and erected by us during the winter of 1906-07. This is a good illustration of recent practice in Mill Building construction, with steel roof trusses supported on steel columns and the columns also carrying girders for travelling cranes. The building is divided into two aisles, that on the left carrying a heavy travelling crane to convey material from the various casting pits, and that on the right shows steel platform supporting furnaces, and the cars for handling material. On the left hand side of this picture is an illustration of the Gas Producer Building erected by us about the same time.

This cut illustrates another view of steel framework in building for Open Hearth plant of the Lake Superior Corporation, at Sault Ste. Marie, erected by us during the winter of 1906-7

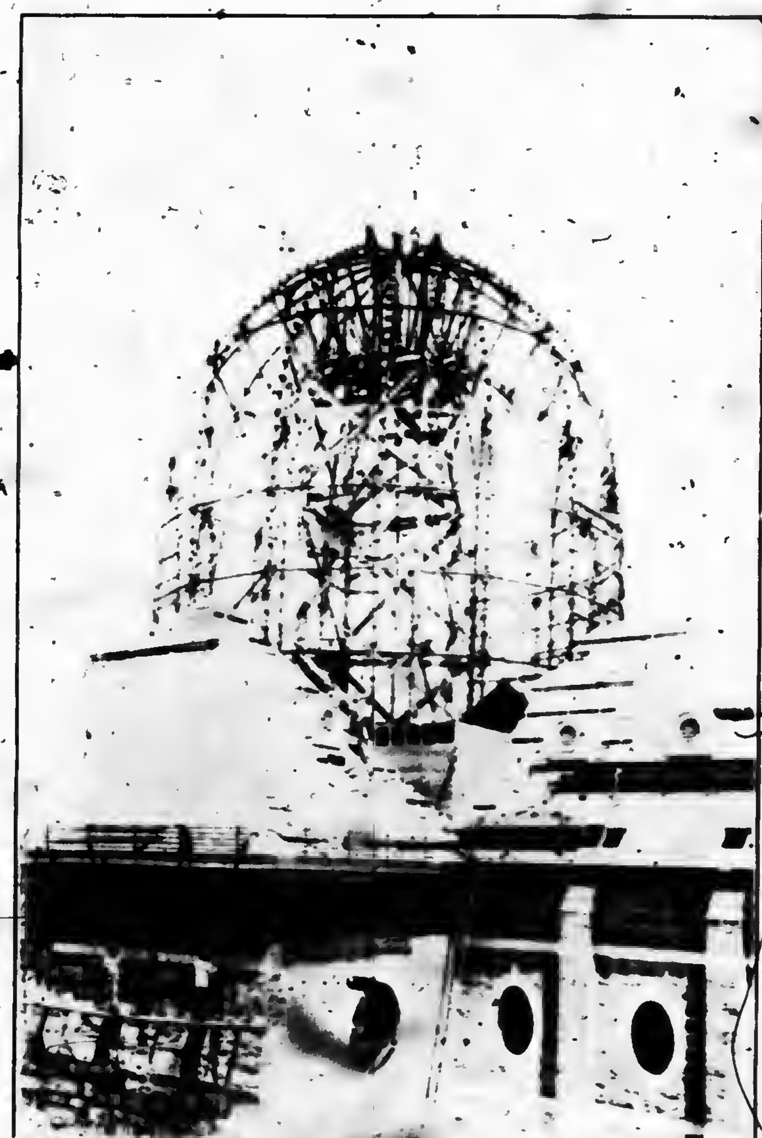
This cut illustrates the structural steel in the grey iron foundry erected by us several years ago for the International Harvester Company, of this city. So far as we know this is the longest steel building used for such purposes in Canada. The over all length of the steel is about 1000' and the width 85'. The construction consists of steel roof trusses carried on steel columns and the columns also support steel runways to handle overhead travelling cranes.

This illustration shows the steel work of our new bridge shops in the course of erection and nearly completed, and ready to receive the roofing and siding.

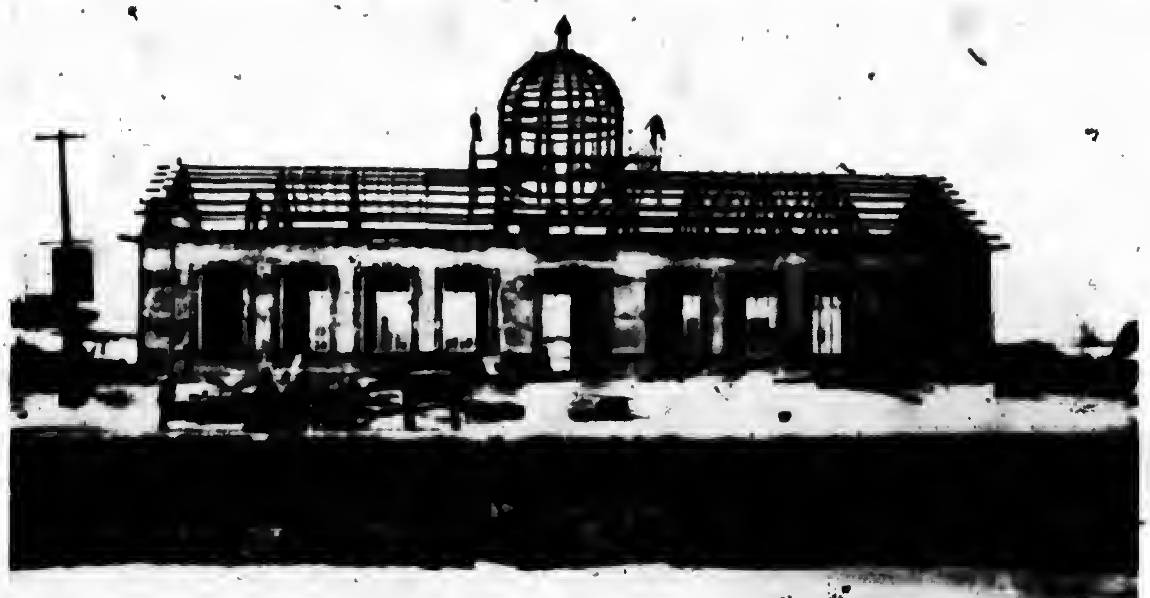


The above cut is an illustration of steel roof trusses on Hamilton Drill Hall [illegible] Armouries, showing method of erection.

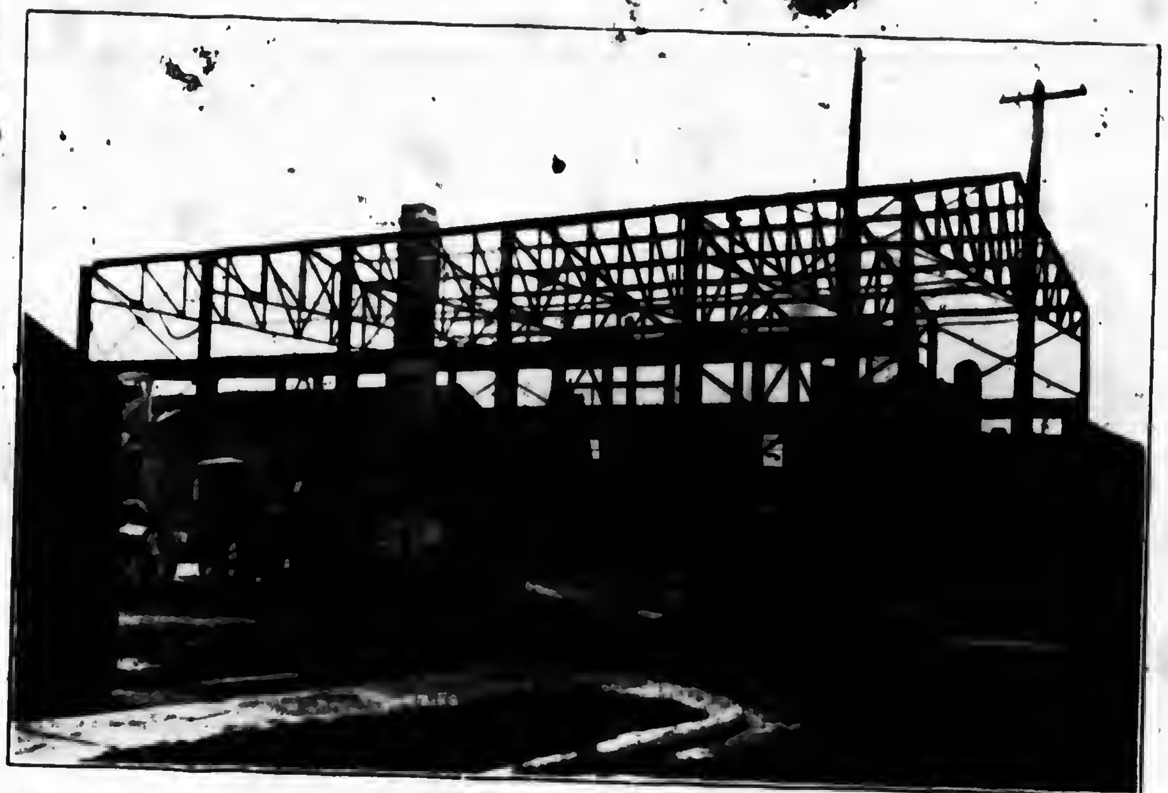
The above illustration shows steel roof on new Drill Hall and Armouries recently erected in the City of Hamilton. This steel is heavy and pleasing in outline. The span of the roof is 130' face to face of walls with a total length of 240' and the height from the under side of the bottom chord at the centre of the truss to the floor of the hall is 52 feet. The netting shown at the bottom of this illustration is placed to permit the playing of indoor baseball and which is necessary to protect the electric lamps and windows.



The above cut illustrates the steel work of large dome on the St. Jean Baptiste Church erected by us in Montreal several years ago. This is a very good illustration of a difficult piece of work.



The above cut illustrates steel roof with steel dome erected by us several years ago, for the Dominion Government, and is used for Power House on the Welland Canal, near Thorold, Ont. This is an ordinary type of roof truss with steel purlins and ordinary dome construction



The above cut illustrates structural steel erected by us in 1907 for the Gartshore-Thomson Pipe and Foundry Company, Hamilton, Ont. This is a very good illustration of structural steel used in recent Foundry Building construction, and is an ordinary type of roof truss with steel purlins resting on steel columns, and it will be noted there are steel runways to carry heavy travelling crane.

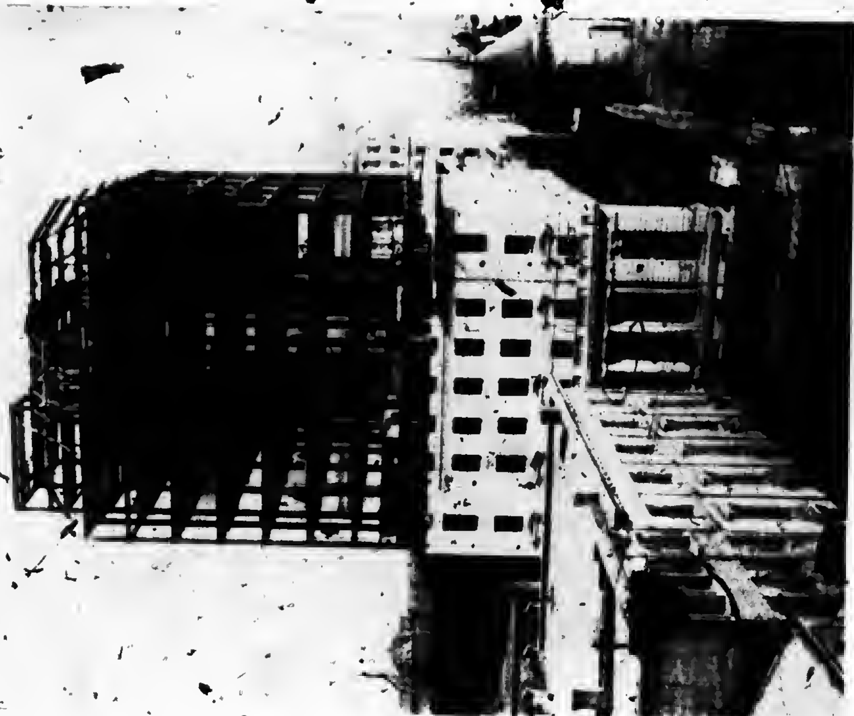
The above cut illustrates the structural steel erected by us in the new Foundry Building for the McGregor, Gourlay Company, of Galt, in 1906. This illustrates the latest type of construction used in buildings for foundry purposes. It will be noted the steel trusses are supported on steel columns and that there are steel runways to support heavy travelling crane.

The above cut illustrates structural steel erected by us for the Hamilton Steel and Iron Company, for Open Hearth Building, several years ago. This illustrates the latest type of construction for buildings of this kind, and since this we have furnished several additions on both ends.

The above cut illustrates simple roof trusses and steel columns, erected by us three years ago, for the Hamilton Steel & Iron Company, and used in connection with their Open Hearth Plant.

The above is an illustration of steel roof trusses, columns, etc., used in the construction of Power House for the Dominion Power & Transmission Company at Decew Falls, Ont., and is one of several buildings erected by us at that point.

THE cut on the opposite page illustrates the structural steel of the new Head Office Building of the Traders' Bank, erected by us in the City of Toronto, four years ago. At the time this building was erected it was the first genuine example of what is known as a "Sky Scraper" to be erected in Canada. The building is 16 storeys high and was erected by us in exactly four months, or at the rate of one floor per week. The illustration shows the steel work about completed and it also shows the fire proof floors being placed in position and the outer walls being erected following after the steel, all operations being conducted at the same time.



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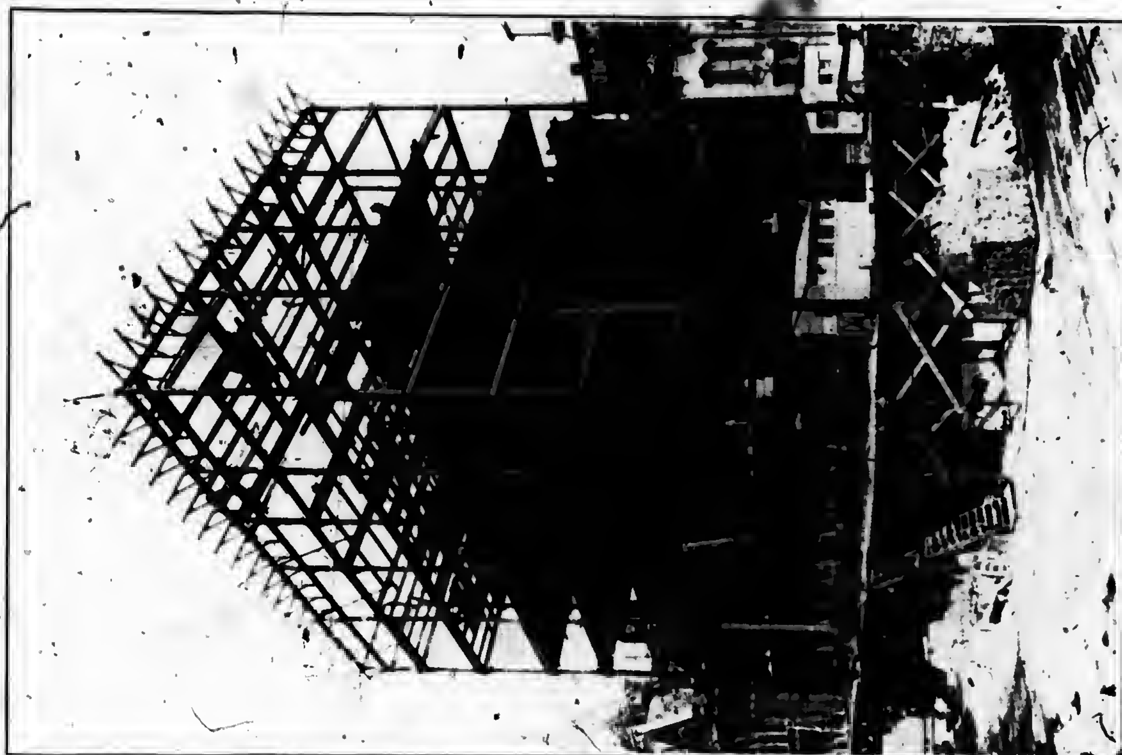
THE cut on the opposite page illustrates steel frame of new Head Office Building of the Federal Life Assurance Company recently erected in the City of Hamilton. It will be seen that the steel is practically completed and the fire proof floors are being placed in position and the walls under construction at same time as steel. The completed building is a very handsome structure and was the first example of this type of building erected in the City of Hamilton.



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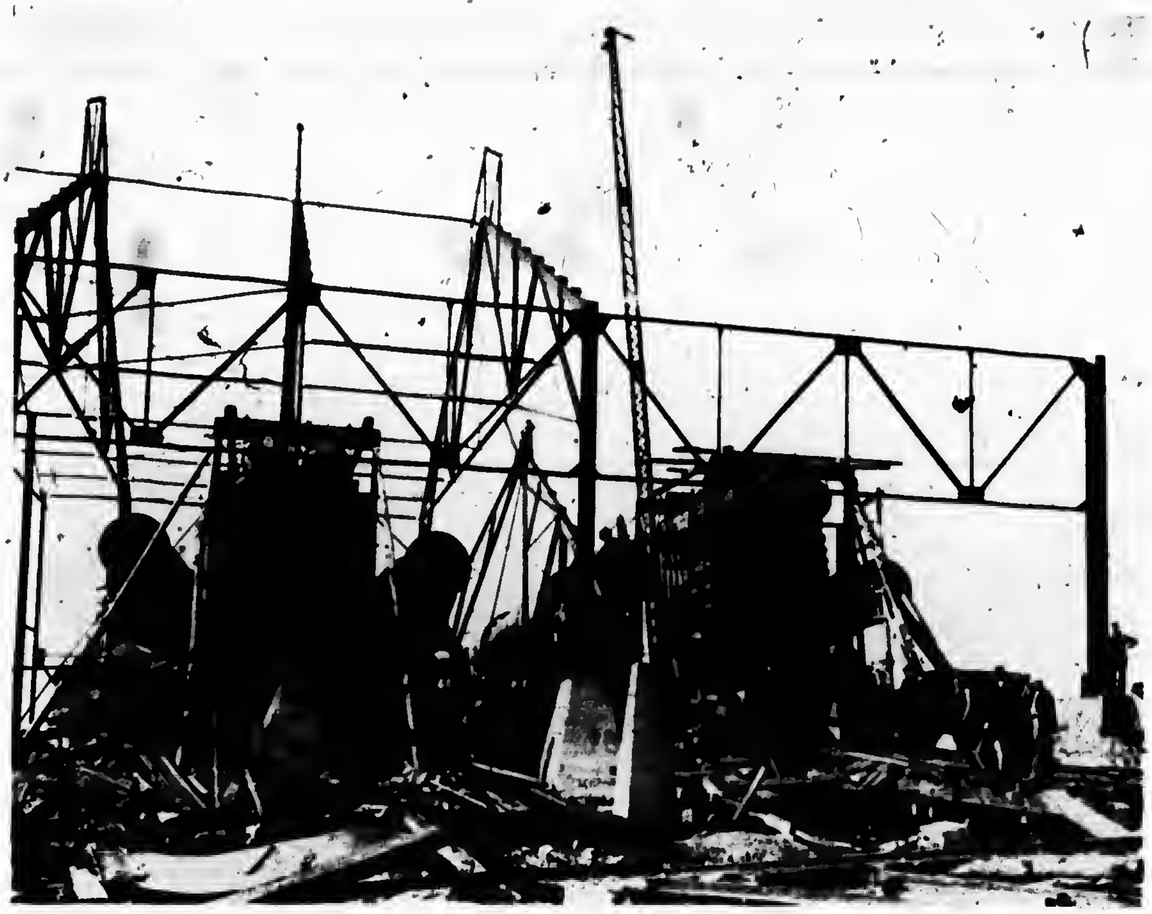
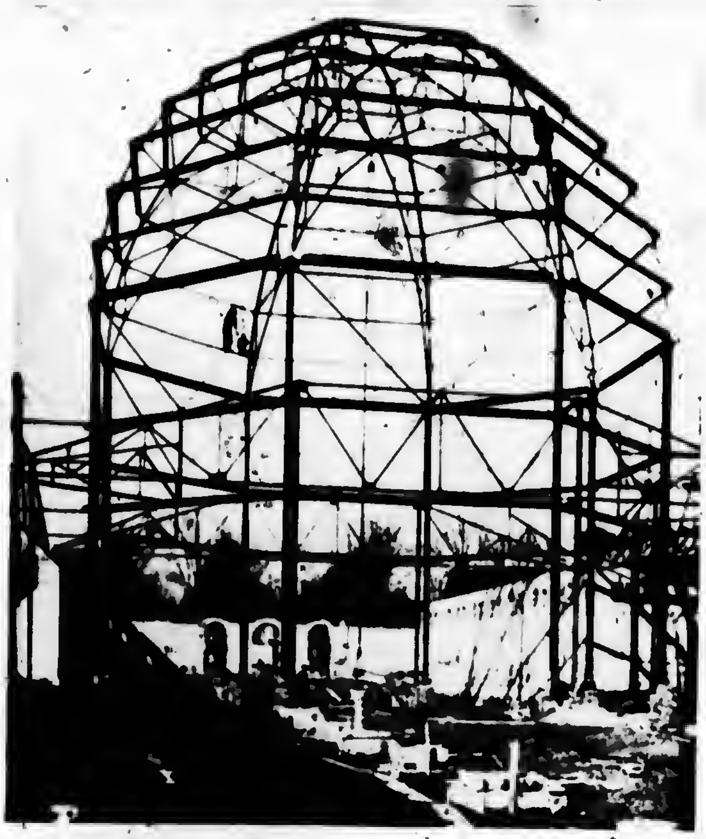
Steel Building for the Ontario Rolling Mills Company, at Hamilton, Ont. Length, 190 feet; width, 125 feet in one clear span; height, 46 feet. Covered with corrugated galvanized sheets. Weight 420,000 pounds. This building was erected by us while the mill was in actual operation, and illustrates the difficulties we often encounter in the erection of such work.



The above cut shows structural steel in the course of erection over the Kiln Room of the Bellville Portland Cement Company, at Point Ann, Ont., near Bellville, and shows the difficulty frequently met with in the erection of structural steel. The trusses here shown are 50 ft. in length, and require to be hoisted in one piece, and it was found extremely difficult to place gin pole favorably for the hoisting of material.

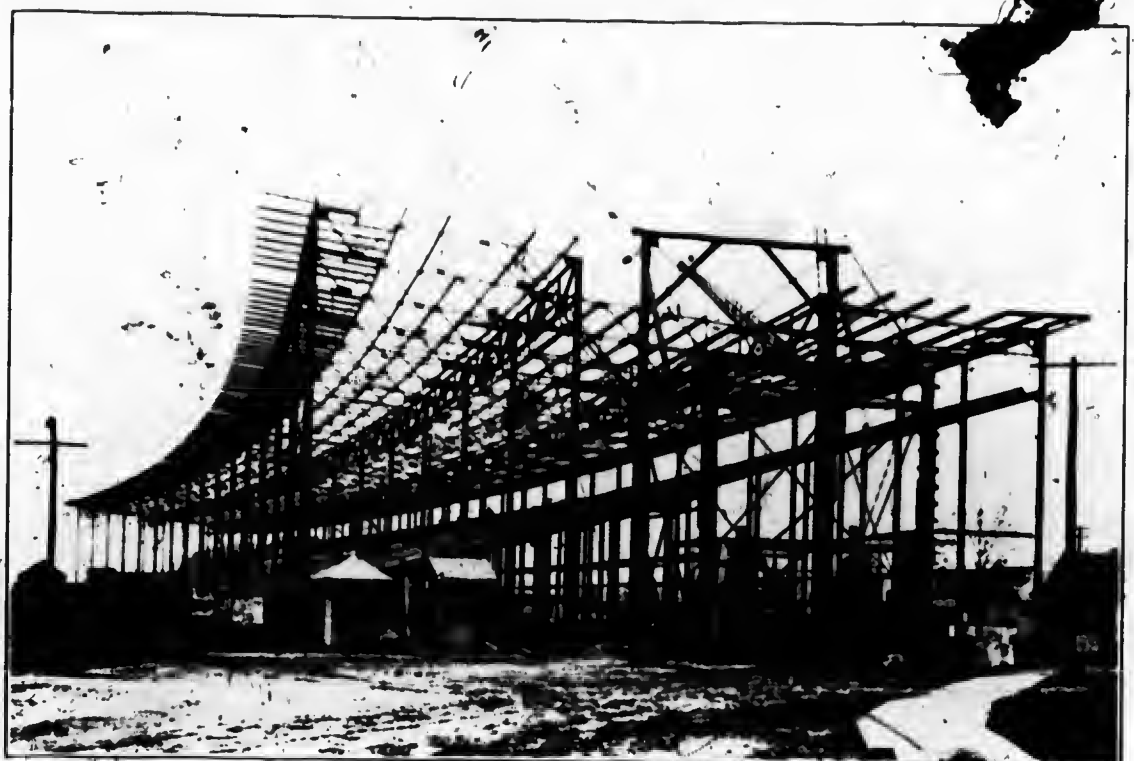
The above cut is a bird's eye view of steel buildings, erected by us, for the Belleville Portland Cement Company, at Point Ann, Ont., near Belleville. Since this cut was made we have erected several additional buildings for this plant.



Dome of Process Building, Toronto Exhibition, erected by us.

THE cut on the opposite page illustrates steel in the course of erection for the new Fire Proof Grand Stand erected by us for the Toronto Exhibition Association in 1907. This is the most modern example of a Grand Stand in the Dominion of Canada, and so far as is known, is one of the largest Grand Stands in the world. This stand is 700' long and has a seating capacity of 15,000 people. The weight of steel in this structure is 1,220 tons, and notwithstanding that the number of individual pieces used in the construction of this stand was 245,000, it was built and erected in record time. The order was placed with us on December 28th, and we completed our contract on June 10th.

The aggregate length of all the pieces of steel used in this grand stand, if placed end to end, would equal about 33½ miles and this steel would be equivalent to about 225,000' of steel rails and would construct a standard railway track equal to about 42½ miles. The total number of rivets used was about 200,000.



The above cut illustrates view of the Grand Stand, at Toronto Exhibition, in the co[illegible] re[illegible]

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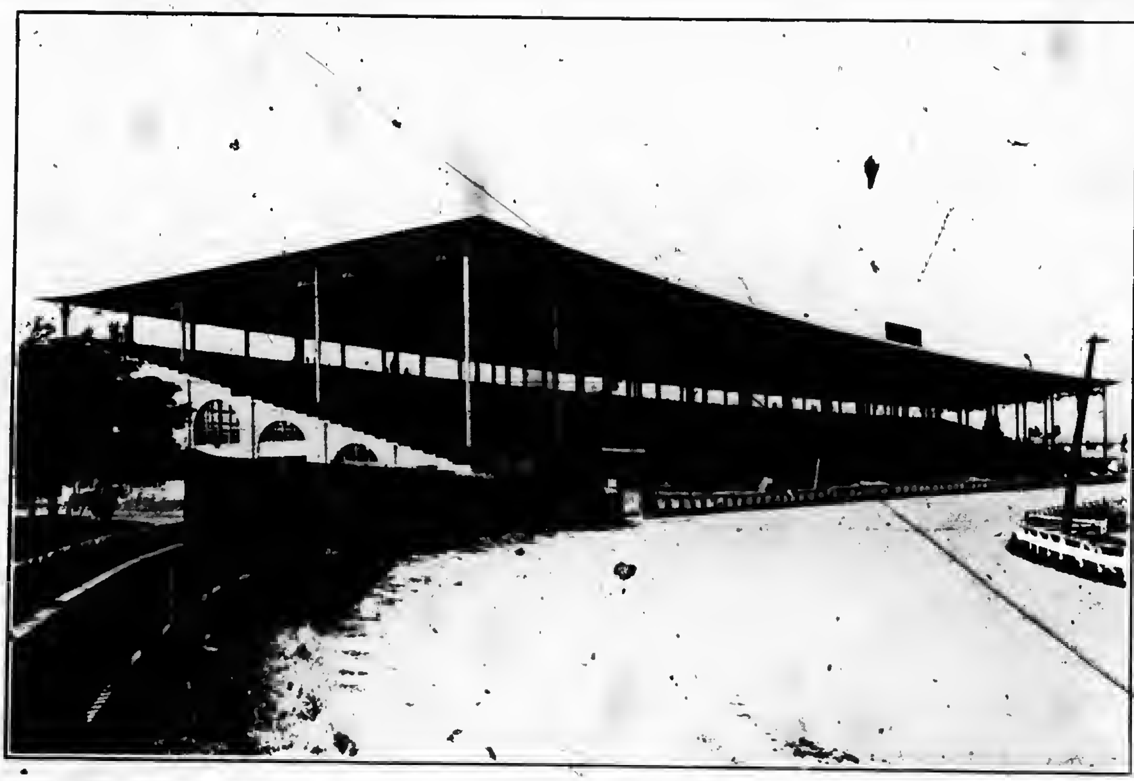
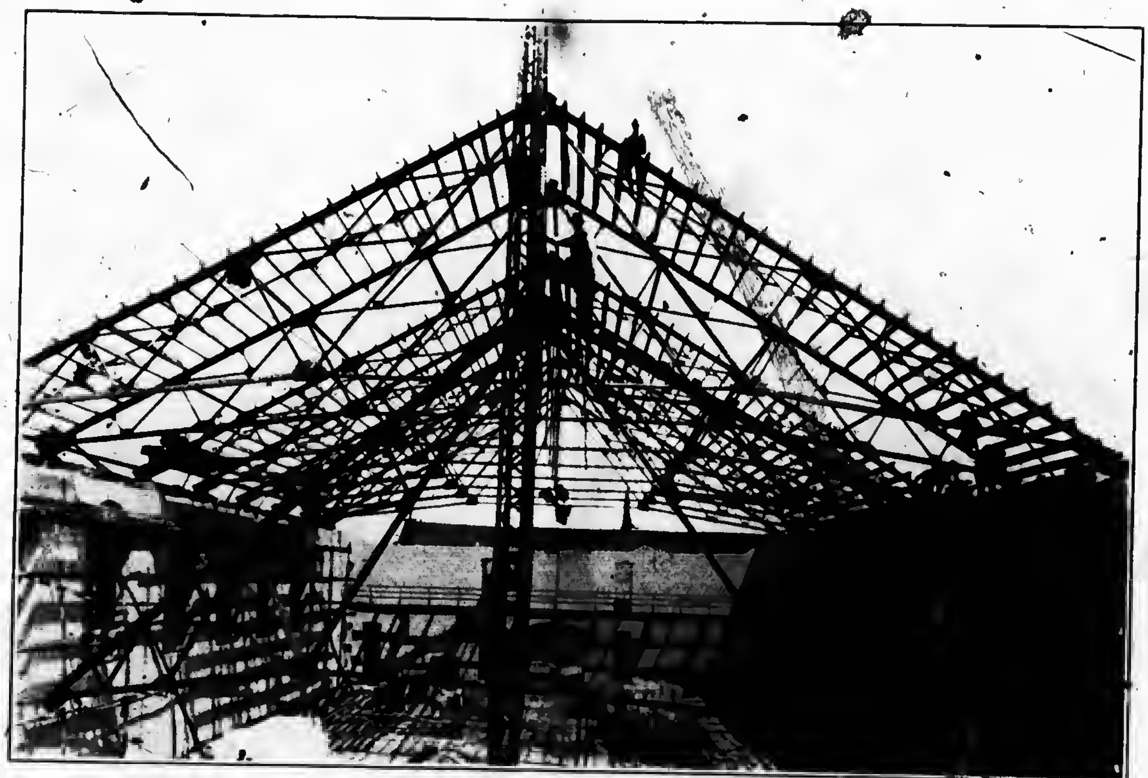


The above cut illustrates a view of the Grand Stand at Toronto Exhibition Grounds fully completed, with concrete terrace, roof, etc., etc.

The above cut is an illustration showing an interior view of Rink erected by us in the Town of Berlin, some years ago. The cut is indistinct, as it is almost impossible to get a good view owing to the size of the building and the height of the trusses. It will be seen, however, that these are steel trusses resting on steel columns and that there are galleries on either side. Rinks vary considerably according to length of span, length of building and various other conditions.



The above cut illustrates the steel roof of Drill Hall and Armoury in course of erection in the City of Peterboro, and is similar in design and size to several Drill Halls built by us in other places. We have furnished steel for Drill Halls at St. Catharines, Sherbrooke, Peterboro, Esquimalt, Brandon, St. Thomas, Ingersoll, Guelph, Windsor, Hamilton and other points.

The above cut shows an interior view of steel building for Open Hearth Plant of the Hamilton Steel & Iron Company. Since the erection of this building, several additions have been added at each end.

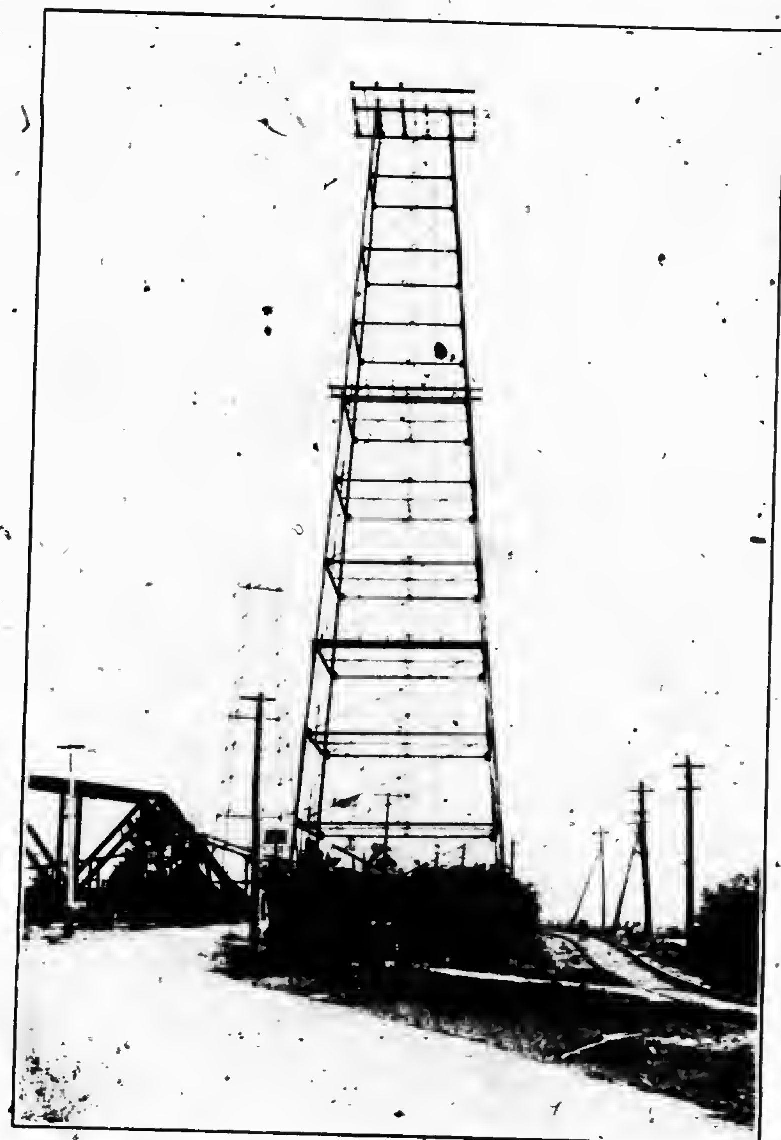
These cuts illustrate small foot bridges used for communication between various factory buildings. The two bridges shown on the top cut were built by us for the Ingersoll Packing Company, Ingersoll, Ont., and the bridge shown in the lower cut was built by us for the Raymond Manufacturing Company, Guelph, Ont.

These are the only illustrations we have of the very large number of these bridges built by us in various parts of the country, a few locations being Penman Manufacturing Company, Paris; Maple Leaf Rubber Company, Port Dalhousie; Canadian Portland Cement Company, Port Colborne; Lehigh Cement Company, Belleville, and various other locations.

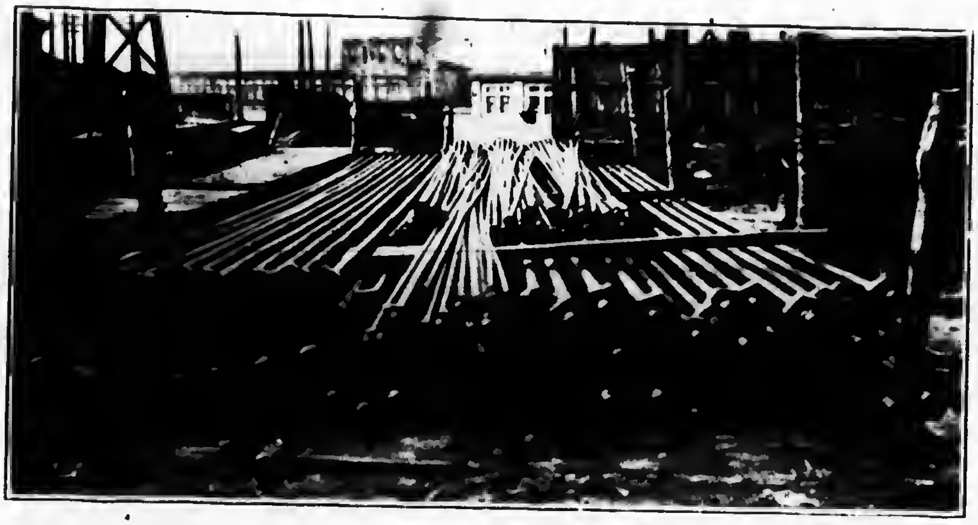
The above cut shows steel inlet valves furnished by us for use in the Welland Canal at Port Colborne. These valves are used for regulating the height of water in the canal.

This cut illustrates a shipment of steel poles built by us for the Welland Canal and similar poles have been built by us for various corporations and companies for electric power transmission, street railways and other similar purposes.

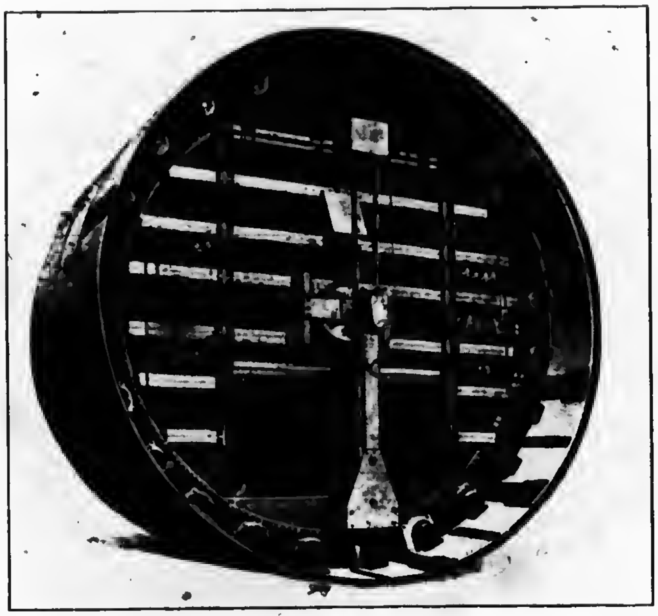
The above cut shows a shipment of steel tubs manufactured by us for a firm of Contractors, and used in connection with Steam Shovel work on Government Canals.



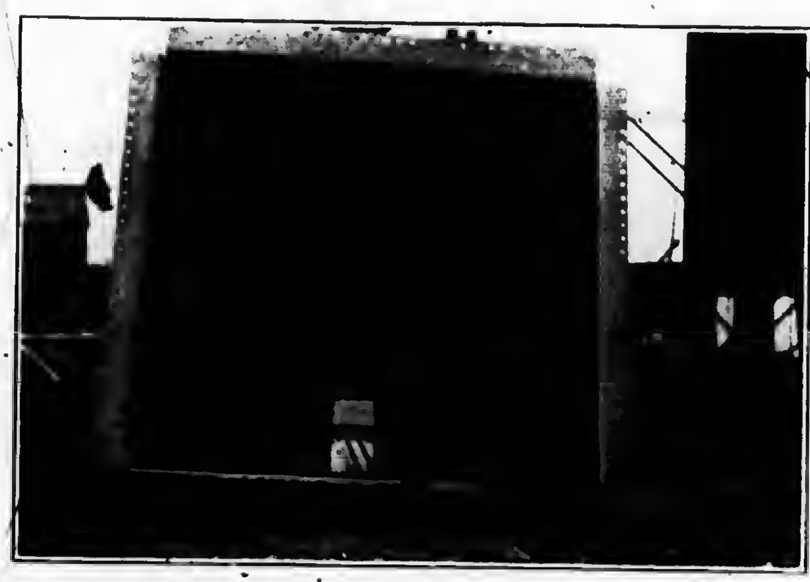
The above illustration shows one of a number of steel towers built by us for the Dominion Power & Transmission Company, carrying their high tension power wires over the Welland Canal and over the Desjardines Canal near Hamilton.



The above cut illustrates a shipment of two car loads of rods to be used in the construction of wooden howe truss span for the Canadian Pacific Railway, in the Rocky Mountains. We have special machinery for fabricating material of this kind, and have furnished large quantities to the C. P. Ry., C. N. Ry. and various other Railways and Contractors in the West.

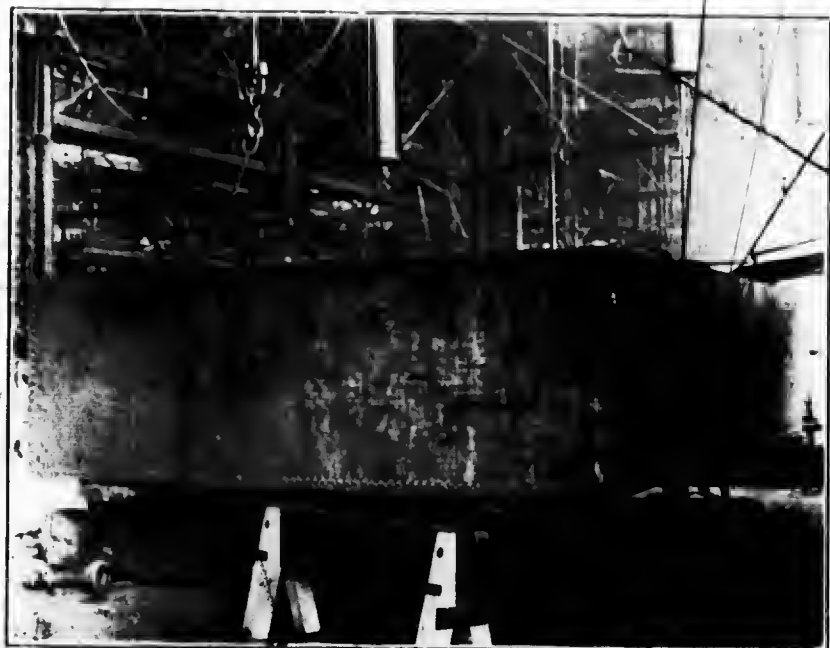


The above cut illustrates a steel shield designe[illegible]nd manufactured by us and used by the Grand Trunk Railway in building St. Clair Tunnel.



The above illustration shows one of a number of steel hoppers built by us for the Canadian Portland Cement Company, Port Colborne, Ont., and we have also built a number of similar hoppers for the National Portland Cement Company, Durham, Ont., Lehigh Cement Company, Belleville, Ont., and for other companies in various parts of Canada.

This illustration shows steel arm (for heavy dredge), which we recently completed. Dredge arms or crane arms of this nature or of any design required can be built promptly by us from stock.



The illustration shows one of a number of steel tanks recently built by us. We build tanks of this pattern or of any other style or design, for use in breweries, distilleries, foundries and other purposes.

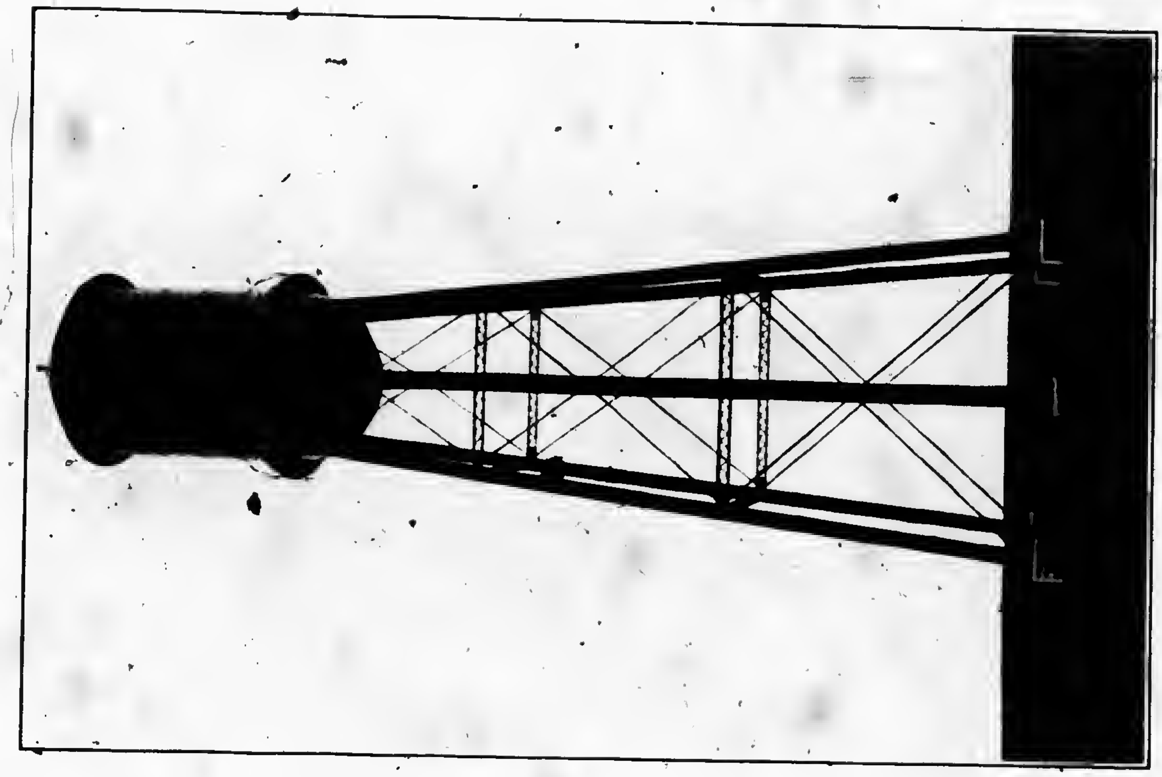
Water Tanks and Towers

ON the opposite page we illustrate steel tower and steel tank for use in connection with Municipal Water Works or manufacturing establishments. This shows the latest design for work of this kind. We have built a number of towers and tanks in various parts of Canada, and of many different designs, heights, capacities, etc. We can build reservoirs or tanks resting direct on concrete foundations or can build steel towers with steel or wood tanks on top of same.

The illustration shows a tank with spherical bottom, and we can also build them with flat bottoms.

The illustration shows a steel tank with wood roof resting on steel frame work, and man holes are provided for entrance into the tank. A ladder extends from the ground to the top of the tank, and inside the tank from top to bottom.

A balcony and railing is provided at the top of the tower and may be of any width required, and the flooring may be of steel or wood, and the balcony railing may be of pipe or lattice work and of any height or design required.



Rods, Bolts, Rivets, Turnbuckles

WE manufacture upset rods 5/8" diameter and up to 3" diameter. These rods are upset at welding heat, and we guarantee greater strength in the threads than in the body of rods.

We manufacture hexagon nuts for bridge rods in all sizes up to 3½" tap.

We have a large stock of square nuts and hexagon nuts of various sizes.

We manufacture round head rivets, countersunk head rivets, and bolts for every purpose.

We carry in stock steel turnbuckles and clevices.

STOCK STEEL

Beams, Angles, Channels, Plates, Etc.

ON pages No. 130 and 131 are illustrations of Stock Yards No. 1 and 2 in connection with Lower and Upper shops. It is customary for us to carry in stock at all times about 5,000 tons of steel of various sections such as Beams, Channels, Angles, Plates, Tees, Zees, Bars, Rods, etc., etc., and our many years experience in carrying a stock of this kind enables us to select the most suitable sizes, weights and lengths. Our stock is at all times well assorted and covers all the standard sizes and weights of Beams from 3" to 24" in depth and standard sizes and weights of Channels from 4" to 15" in depth and practically all the standard sizes and weights of Angles rolled by American and European Mills This material is in lengths varying from a few feet up to 60 feet.

Our stock of plates is very complete and covers material from 8" in width to 96" in width and in thickness varying from 3/16" to 1" and in some special cases plates up to 1½" in thickness.

While we do not make a practice of carrying in stock Zees and Tees we have at different times a few odd sections that will be shown on our fortnightly stock lists.

As well as the sections mentioned above we have in stock at all times a considerable assortment of Round and Square Steel Bars.

We stock gas pipe 1", 1¼", 1½" and 2" diameter.

We issue a Stock List Twice a Month and will put you on Our Mailing List if you advise us you would like to have stock list regularly.

Stock Yards at Shop No. 1.

Stock Yards at Shop No. 2.

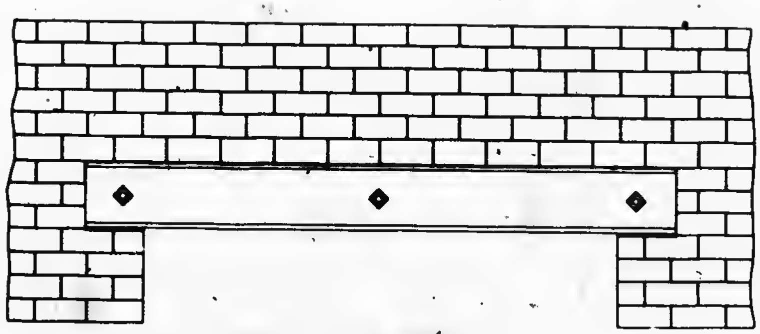
Girders

THE two cuts shown on the opposite page illustrate beam girders of which a great many are used for various purposes. In remodelling the fronts of old buildings and in arranging the fronts of new buildings, it is found necessary to use steel girders to support the brick work above. The use of such girders enables a large clear opening to be provided, which would permit of subsequent alterations to the front of building without interference with the building proper. The illustrations show girders consisting of two beams which is usually found sufficient, the size and weight of the beams being governed by the length of span and the loads to be carried. The upper illustration shows a beam girder in place.

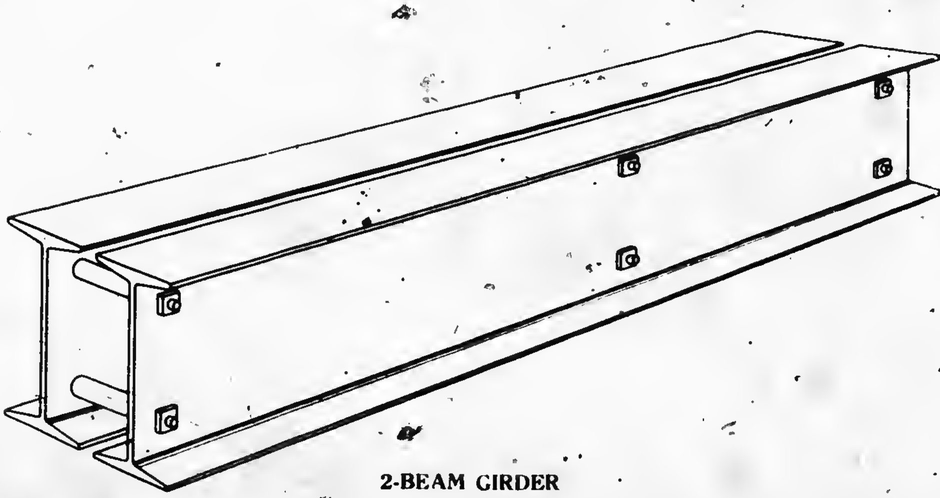
In the fronts of ordinary store buildings it is usual to have a clear open space, but if necessary columns can be provided at the ends and any number of columns can be provided at intermediate points. In fact the girders can be designed and arranged to suit the conditions that exist and to meet the views of the proprietor or contractors having the work in hand.

On page No. 135 will be found illustrations showing cross sections of similar beam girders consisting of two and three beams.

Girders like this may be made of one or more beams, generally two beams are necessary.

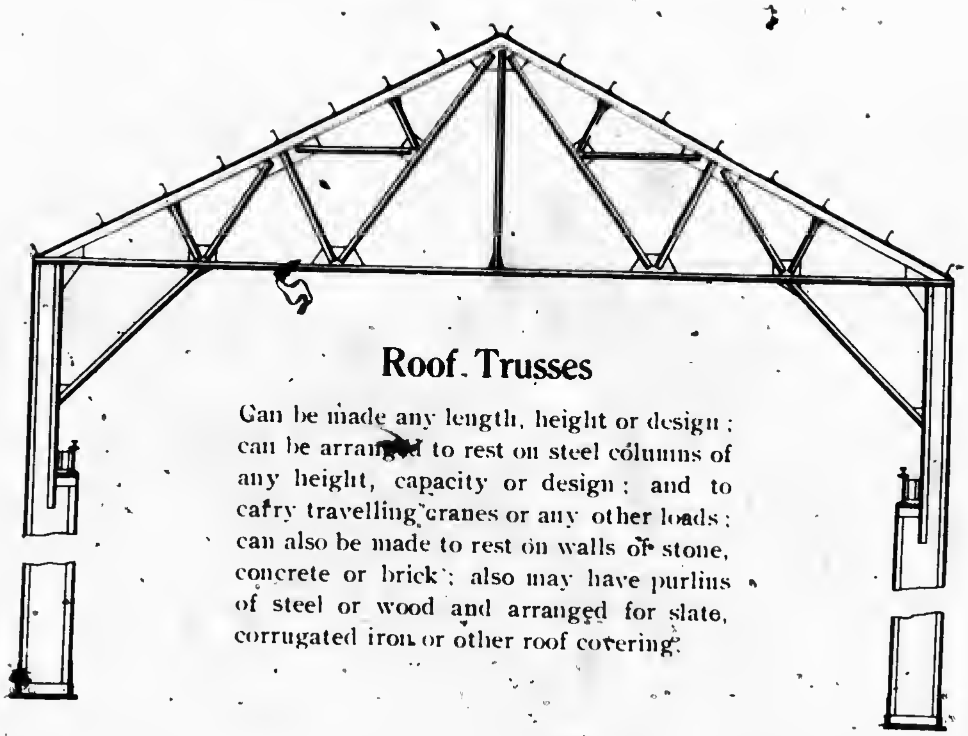


BEAM GIRDER SET IN WALL



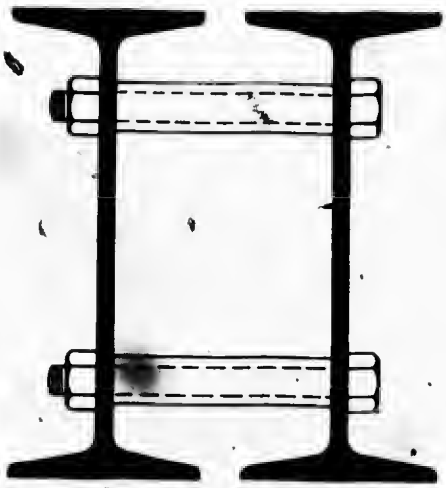
Girders like this can be made any length and for any thickness of wall, and can be used in new or old buildings.

2-BEAM GIRDER

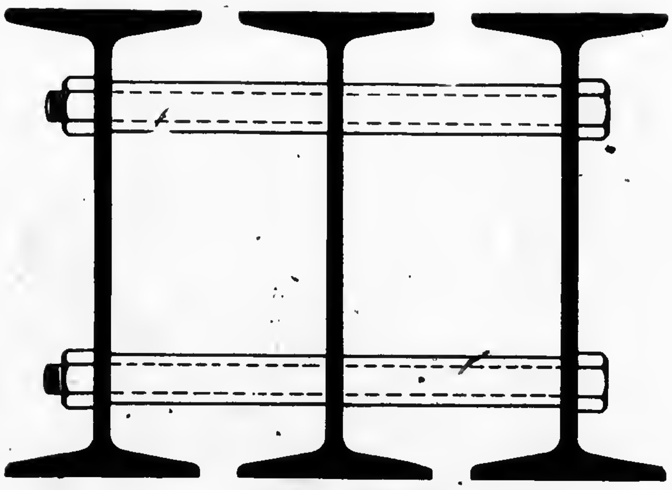


Roof Trusses

Can be made any length, height or design; can be arranged to rest on steel columns of any height, capacity or design; and to carry travelling cranes or any other loads; can also be made to rest on walls of stone, concrete or brick; also may have purlins of steel or wood and arranged for slate, corrugated iron or other roof covering.



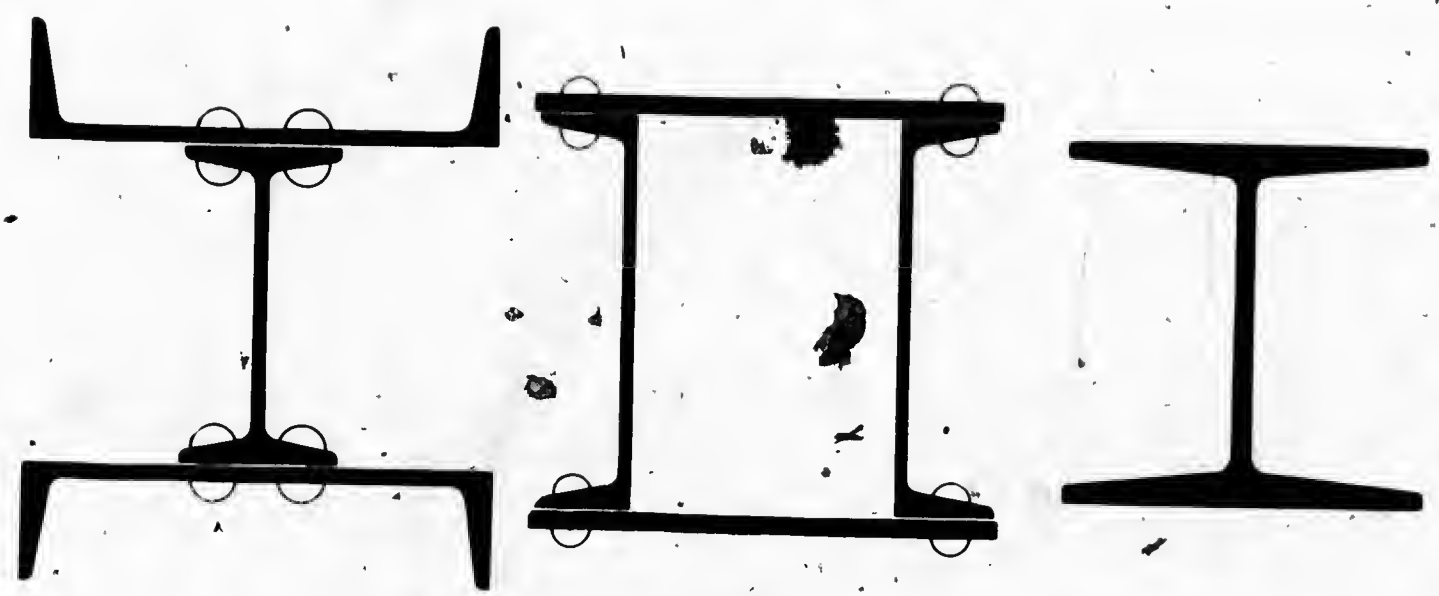
2-BEAM GIRDER



3-BEAM GIRDER

The above cuts show cross sections of girders consisting of two beams and three beams, a full description of which will be found on page 132. Girders of two, three or more beams and girders of various other constructions to meet special conditions, can be designed, built and shipped promptly.

We have a table showing safe loads uniformly distributed for standard and special beams. A copy of this table will be sent to any person to whom it will be of service.



COLUMNS

The above cuts show the types of columns most frequently used in building construction.

Columns

WE have a large stock of various sizes of broad flange beams which are manufactured especially for column construction. For ordinary conditions this type of column is very economical owing to the small amount of labor to make broad flange beams into columns. The short time necessary for manufacture of these beams into columns enables us to ship beam columns in a very short time after order is received.

In the construction of steel frame buildings and where very great loads are to be supported it is most economical to use columns made of channels and cover plates. The advantage of this type of columns is the economical distribution of material in the column and the comparatively low cost of labor in manufacture.

We make columns of beams and channels for special conditions, but columns of this type are not as economical as either of the columns described above.

Cast Iron Columns for building fronts and interior store construction are sometimes specified. We have patterns for the manufacture of cast iron columns of various designs. Cast iron columns furnished by us are made of best quality iron for this purpose. We give special attention to appearance of columns and invariably we machine the ends of columns in order to obtain a perfect bearing for columns on their foundations and for material resting on tops of columns. We consider the machining of ends of cast iron columns the most important detail in their manufacture. Having men who are constantly engaged in moulding cast iron columns we are in a position to guarantee best results and shipments in the shortest time necessary to execute orders.

For special conditions we can manufacture many other types of steel columns. We are glad to design and manufacture special columns to meet emergencies that occur occasionally in building construction.

Some Important Engineering Works Built by Us

Traders Bank Building, Toronto, Ontario.

St. Clair Tunnel, for Grand Trunk Railway, Air Locks and Diaphrames, used in construction.

Steel Side Wheel Steamer Chippewa, 311' over all, 67' beam over guards.

The [illegible]y Creek Arch Bridge in the Selkirk Mountains for Canadian Pacific Railway. Total length 483', Arch Span 336', weight 800 tons.

The Rouge River Bridge, a double track span 140' over all, weight 265 tons, for the Grand Trunk Railway System.

The fire-proof building for R. Simpson & Co., Toronto. The weight of steel in same being 2,500,000 pounds.

Steel roofs for Drill Halls, at Montreal, Hamilton, Brockville, Peterboro, Windsor, Guelph, St. Catharines, Sherbrooke, Brandon, Esquimalt.

Grand Stands for Ontario and Fort Erie Jockey Clubs, Toronto Exhibition Association.

Steel and iron work for Sault Ste Marie and Soulanges Canal Locks.

Burlington Canal swing bridge, first built in Canada.

Steel roof for Western Block Departmental Building, Ottawa, Ont.

Bank of Hamilton Building, Hamilton, Ont.

Federal Life Assurance Building, Hamilton, Ont.

Steel Ship Docks, for Grand Trunk, C. P. Railway, Lake Erie and Detroit River Railways, and Michigan Central Railways.

Steel Water Towers and Tanks for St. Lambert, Quebec, Grand Trunk Railway, St. Clair Tunnel Co., and Amherstburg, Ont.

Observation Tower at Lundy's Lane.

Incline Railway, Hamilton, Ont.

Round Houses at Three Rivers, Trenton, Port Arthur and Sherbrooke.

Gas Tanks for Berlin Gas Co.

We have also supplied as follows:

Turntables for Canadian Pacific Railway, Central Ontario Railway, Hamilton & North Western Railway, Northern & Pacific Junction Railway, Ontario & Quebec Railway, Toronto, Hamilton & Buffalo Railway.

Bell Buoys for Dominion Government, for Owen Sound, Sault Ste. Marie, Brockville and the Maritime Provinces.

Cement Mixers for St. Clair Tunnel Company and other contractors.

Riveted Steel Water Pipe for Cataract Power Company and others.

Steel Cranes for London Steel Works, Gartshore-Thomson Pipe Company, Ontario Rolling Mills Company, Hamilton Tool Company, Vulcan Iron Company, Ontario Car Works.

We have constructed a large number of bridges for many of the trunk lines and take pleasure in presenting a list of Companies for whom we have done work :—

Berlin & Waterloo Railway
Canadian Pacific Railway Co.
Canadian Northern Railway
Canada Atlantic Railway
Central Ontario Railway
Canada Southern Railway
Crows Nest Pass Railway
Columbia & Western Railway
Grand Trunk Railway System
Great Northern Railway
Guelph Junction Railway
Hamilton & North Western Railway
Hamilton Street Railway Co.
Hamilton Radial Railway
Hamilton, Grimsby & Beamsville Railway
James Bay Railway
Kingston & Pembroke Railway
Lake Erie & Detroit River Railway
London Street Railway
Mackenzie, Mann & Co.
Michigan Central Railroad
Midland Railway
Metropolitan Railway
North Shore Railway
Niagara Central Railway.
Niagara Falls Park & River Railway
Ontario & Quebec Railway
Ottawa Electric Railway
Sandwich & Windsor Railway
St. Maurice Valley
Toronto, Grey & Bruce Railway
Toronto, Hamilton & Buffalo Railway
Tilsonburg, Lake Erie & Pacific Railway
Waterloo Junction Railway
Windsor & Amherstburg Railway

AND ALSO FOR

Department Public Works
" Crown Lands
Department Railways and Canals
" Marine and Fisheries

We have also constructed hundreds of City and Highway Bridges for all parts of the country. A partial list of Municipalities for whom we have done work is given below:

City of Brantford
" " Chatham
" " Guelph
" " Hamilton
" " London
" " Ottawa
" " Quebec
" " St. Catharines
" " Toronto
" " Winnipeg
Town " Ayr
" " Ailsa Craig
" " Brampton
" " Blair
" " Breslau
" " Barbers Mills
" " Cote St. Antoine
" " Crysler
" " Dundas

Town of Louisville
" " Manotick
" " Napanee Mills
" " Nelson
" " Norval
" " Paris
" " Palermo
" " Plattsville
" " Regina
" " St. Marys
" " Selkirk
" " St. Chrysostom
" " Teeswater
" " Trenton
" " Terra Cotta
" " Thorold
" " Vienna
" " Vittoria
" " Whitevale

County of Waterloo
" " York
Township " Binbrook
" " Blenheim
" " Pentinck
" " Brant
" " Cape Breton
" " Chinguacousy
" " Camden
" " Down
" " Esquesing
" " Etobicoke
" " Harwich
" " Malahide
" " Manitoulin Island
" " Markham
" " Niagara
" " N. Fredericksburg
" " Nelson

Town of Drumquin
" " Dawn Mills
" " Edmonton
" " Galt
" " Goderich
" " Graham Road
" " Grimsby
" " Hamburg
" " Hespeler
" " Hunters Mills
" " Hanover
" " Ingersoll
" " Indian Head
" " Kemptville
" " Komoko
" " Lynn Valley
" " Lakefield

County of Brant
" " Bruce
" " Elgin
" " Essex
" " Grey
" " Haldimand
" " Halton
" " Huron
" " Kent
" " Lincoln
" " Middlesex
" " Norfolk
" " Oxford
" " Peel
" " Peterborough
" " Wellington
" " Wentworth

Township of Oneida
" " Pembina
" " Pickering
" " Rainham
" " Raleigh
" " South Finch
" " Saltfleet
" " Toronto
" " Towsend
" " Trafalgar
" " Walpole
" " Wilmott
" " Woodhouse
" " Willougby
" " Waterloo
" " York

Government of Dominion of Canada
" " Province of Ontario
" " Province of Quebec
" " Province of Nova Scotia

Government of North West Territories
" " British Columbia
" " Alberta
" " Saskatchewan

Building Work

for the following corporations, companies and other firms, will serve to illustrate our work in that line :

Bell Telephone Co.,	Montreal, P. Q
Berlin Gas Co ,	Berlin, Ont.
Berlin Machine Works,	Hamilton.
Belleville Portland Cement Co.,	Belleville, Ont.
Canadian General Electric Co.	Peterboro, Ont.
Canada Life Assurance Co.,	Hamilton, Ont.
Canadian Copper Co.,	Sudbury, Ont.
Cataract Power Co.,	Hamilton, Ont.
Chandiere Electric Light & Power Co.,	Ottawa, Ont.
Canadian Pacific Railway Co.,	Vancouver, B. C., Montreal, Toronto, Port Arthur, etc.
Chambly Power Co.,	Chambly, P. Q.
Canadian Shovel & Tool Co.,	Hamilton.
Central Presbyterian Church,	Hamilton.
Canadian Niagara Power Co.,	Niagara Falls, Ont.
Corby Distillery,	Belleville.
Canadian Portland Cement Co.,	Port Colborne, Ont.
Canada Foundry Co.,	Toronto, Ont.
Department of Public Works,	Ottawa, Ont.
Dundas St. Centre Methodist Church,	London, Ont.

BUILDING WORK—*Continued.*

Dominion Power & Transmission Co.,	Hamilton.
Electro Metals,	Welland.
Electric Light Plants,	Brockville, Belleville, Berlin, Hamilton, London and St. Catharines, Ont.
Fort Erie Jockey Club, Grand Stand,	Fort Erie, Ont.
Frederick W. Watkins,	Hamilton, Ont.
Gartshore-Thomson Pipe Co.,	Hamilton, Ont.
Gas Company,	St. Thomas, Ont.
Grand Trunk Railway,	Hamilton, Ont.
Grand Trunk Railway,	Toronto, Ont.
Galt Water Works,	Galt, Ont.
Gas Works,	Berlin, Stratford, Belleville, Hamilton and St Catharines, Ont.
Grand Trunk Railway System,	Stratford, Ont.
Gospel Tabernacle,	Hamilton, Ont.
Hamilton Jockey Club, Grand Stand,	Hamilton, Ont.
Hamilton Elevator Co.,	Hamilton, Ont.
Hamilton Collegiate Institute,	Hamilton, Ont.
House of Refuge,	Simcoe, Ont.
Hamilton Street Railway,	Hamilton, Ont.
Hamilton & Barton Incline Railway Co.,	Hamilton, Ont.
Hall (Richard) & Son,	Peterboro, Ont.

Hamilton Gas Co.,	Hamilton, Ont.
High Schools,	Paris and Peterboro.
Hamilton Steel & Iron Co.,	Hamilton, Ont.
Hosmer Mines,	Bankhead, Alta.
International Harvester Co.,	Hamilton, Ont.
Jacques Cartier Water Power Co.,	St. Gabriel, Que.
Kenleith Paper Co.,	St. Catharines, Ont.
London Water Works,	London, Ont.
London Market Shelter,	London, Ont.
London Street Railway,	London, Ont.
London Savings & Investment Society,	London, Ont.
Lehigh Portland Cement Co.,	Belleville, Ont.
Montreal Drill Hall,	Montreal, P. Q.
Montreal Street Railway Co.,	Montreal, P. Q.
Metropolitan Railway Co.,	Toronto, Ont.
Michigan Central Railroad,	St. Thomas, Ont.
M. Beatty & Sons,	Welland, Ont.
McKinnon Dash & Metal Co.,	St. Catharines, Ont.
McGregor, Gourlay Co.,	Galt, Ont.
Niagara Falls Park & River Railway,	Niagara Falls, Ont.
National Portland Cement Co.,	Durham, Ontario.
Normal Schools,	Hamilton, Peterboro, North Bay and Stratford,

BUILDING WORK—*Continued*

Ottawa Street Railway Co.,	Ottawa, Ont.
Ontario Rolling Mill Co.,	Hamilton, Ont.
Ontario Jockey Club Grand Stand,	Toronto, Ont.
Ontario Iron & Steel Co.,	Welland.
Ontario Portland Cement Co.,	Blue Lake, Ont.
Ontario Power Co.,	Niagara Falls, Ont.
Post Office,	Hamilton, Ont.
Raven Lake Cement Co.,	Ravenlake, Ont.
St. Jean Baptiste Church,	Montreal, P. Q.
St. Clair Tunnel Co.,	Sarnia, Ont.
Sherman Avenue Presbyterian Church,	Hamilton.
St. James' Presbyterian Church,	Hamilton.
Seagram Distillery,	Waterloo, Ont.
Savoy Theatre,	Hamilton, Ont.
Sun Cement Co.,	Owen Sound, Ont.
The R. Simpson Co.,	Toronto, Ont.
Toronto Railway Co.,	Toronto, Ont.
Taylor, Forbes Co.,	Guelph, Ont.
Toronto Hardware Manufacturing Co.,	Toronto, Ont.
Technical School,	Hamilton.
Union Station,	Toronto, Ont.
Wilson Carbide Works,	St. Catharines, Ont.
Walker (Hiram) & Sons' Co.,	Walkerville, Ont.

Weights and Dimensions of Steel I Beams

Depth of Beam Inches	Weight per Foot Pounds	Thickness of Web Inches	Width of Flange Inches
3	7.50	0.361	2.521
	6.50	0.263	2.423
	5.50	**0.170**	**2.330**
4	10.50	0.410	2.880
	9.50	0.337	2.807
	8.50	0.263	2.733
	7.50	**0.190**	**2.660**
5	14.75	0.504	3.294
	12.25	0.357	3.147
	9.75	0.210	**3.000**
6	17.25	0.475	3.575
	14.75	0.352	3.452
	12.25	**0.230**	**3.330**
7	20.00	0.458	3.868
	17.50	0.353	3.763
	15.00	**0.250**	**3.660**
8	25.50	0.541	4.271
	23.00	0.449	4.179
	20.50	0.357	4.087
	18.00	**0.270**	**4.000**
9	35.00	0.732	4.772
	30.00	0.569	4.609
	25.00	0.406	4.446
	21.00	**0.290**	4.330
10	40.00	0.749	5.099
	35.00	0.602	4.952
	30.00	0.455	4.805
	25.00	**0.310**	**4.660**
12	35.00	0.436	5.086
	31.50	0.350	5.000
	55.00	0.822	5.612
	50.00	0.699	5.489
	45.00	0.576	5.366
	40.00	**0.460**	**5.250**

Depth of Beam Inches	Weight per Foot Pounds	Thickness of Web Inches	Width of Flange Inches
15	55.00	0.656	5.746
	50.00	0.558	5.648
	45.00	0.460	5.550
	42.00	**0.410**	**5.500**
15	75.00	0.882	6.292
	70.00	0.784	6.194
	65.00	0.686	6.096
	60.00	**0.590**	**6.000**
15	100.00	1.184	6.774
	95.00	1.085	6.675
	90.00	0.987	6.577
	85.00	0.889	6.479
	80.00	**0.810**	**6.400**
18	70.00	0.749	6.259
	65.00	0.637	6.177
	60.00	0.555	6.095
	55.00	**0.460**	**6.000**
20	75.00	0.649	6.399
	70.00	0.575	6.325
	65.00	**0.500**	**6.250**
20	100.00	0.884	7.284
	95.00	0.840	7.210
	90.00	0.737	7.137
	85.00	0.663	7.063
	80.00	**0.600**	**7.000**
24	100.00	0.754	7.254
	95.00	0.692	7.192
	90.00	0.631	7.131
	85.00	0.570	2.070
	80.00	**0.500**	**7.000**

Weights in heavy print are standard, others are special.

All weights of Structural Material given in pounds per foot.

STRUCTURAL SHAPES. Beams, Channels, Angles, Plates, FOR PROMPT SHIPMENT

Weight of Steel Angles

(With Fillet)

PER LINEAL FOOT IN POUNDS

Size in Inches	THICKNESS IN INCHES 1/8	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16	3/4	13/16	7/8	15/16	1
8 x 8	..	..	..	..	..	..	26.4	29.6	32.7	35.8	38.9	42.0	45.0	48.1	51.0
7 x 3½	..	..	..	..	..	15.0	17.0	19.1	21.0	23.0	24.9	26.8	28.7	30.5	32.3
6 x 6	..	..	..	..	14.9	17.2	19.6	21.9	24.2	26.5	28.7	31.0	33.1	35.3	37.4
6 x 4	..	..	..	..	12.3	14.3	16.2	18.1	20.0	21.8	23.6	25.4	27.2	28.9	30.6
6 x 3½	..	..	..	..	11.7	13.5	15.3	17.1	18.9	20.6	22.4	24.0	25.7	27.3	28.9
5 x 5	..	..	..	..	12.3	14.3	16.2	18.1	20.0	21.8	23.6	25.4	27.2	28.9	30.6
5 x 4	..	..	..	..	11.0	12.8	14.5	16.2	17.8	19.5	21.1	22.7	24.2	..	..
5 x 3½	..	..	..	8.7	10.4	12.0	13.6	15.2	16.8	18.3	19.8	21.3	22.7	..	..
5 x 3	..	..	..	8.2	9.8	11.3	12.8	14.3	15.7	17.1	18.5	19.9	..	..	..
4½ x 3	..	..	..	7.7	9.1	10.6	11.9	13.3	14.7	16.0	17.3	18.5	..	..	..
4 x 4	..	..	..	8.2	9.8	11.3	12.8	14.3	15.7	17.1	18.5	19.9	..	..	..
4 x 3½	..	..	..	7.7	9.1	10.6	11.9	13.3	14.7	16.0	17.3	18.5	..	..	..
4 x 3	..	..	..	7.2	8.5	9.8	11.1	12.4	13.6	14.8	16.0	17.1	..	..	..
3½ x 3½	..	..	..	7.2	8.5	9.8	11.1	12.4	13.6	14.8	16.0	17.1	..	..	..
3½ x 3	..	..	..	6.6	7.9	9.1	10.2	11.4	12.5	13.6	14.7	15.8	..	..	..
3½ x 2½	..	..	4.9	6.1	7.2	8.3	9.4	10.4	11.5	12.5	..	..	..	..	..
3½ x 2	..	..	4.3	5.3	6.3	7.2	8.1	9.0	..	..	..	..	..	..	..
3 x 3	..	..	4.9	6.1	7.2	8.3	9.4	10.4	11.5	..	..	..	..	..	..
3 x 2½	..	..	4.5	5.6	6.6	7.6	8.5	9.5	..	..	..	..	..	..	..
3 x 2	..	3.1	4.1	5.0	5.9	6.8	7.7	..	..	..	..	..	..	..	..
2¾ x 2¾	..	..	4.5	5.6	6.6	7.6	8.5	..	..	..	..	..	..	..	..
2½ x 2½	..	3.1	4.1	5.0	5.9	6.8	7.7	..	..	..	..	..	..	..	..
2½ x 2	..	2.8	3.7	4.5	5.3	6.1	6.8	..	..	..	..	..	..	..	..
2½ x 1½	..	2.4	3.2	3.9	4.6	5.3	6.0	..	..	..	..	..	..	..	..
2¼ x 2¼	..	2.8	3.7	4.5	5.3	6.1	6.8	..	..	..	..	..	..	..	..
2¼ x 1½	..	2.3	3.0	3.7	4.4	5.0	5.6	..	..	..	..	..	..	..	..
2 x 2	..	2.5	3.2	4.0	4.7	5.3	..	..	..	..	..	..	..	..	..
2 x 1½	..	2.1	2.8	3.4	4.0	..	..	..	..	..	..	..	..	..	..
2 x 1¼	..	2.1	2.7	3.3	3.8	..	..	..	..	..	..	..	..	..	..
1¾ x 1¾	..	2.2	2.8	3.4	4.0	4.6	..	..	..	..	..	..	..	..	..
1¾ x 1¼	..	2.0	2.6	3.3	3.9	..	..	..	..	..	..	..	..	..	..
1½ x 1½	1.3	1.8	2.4	2.9	3.4	..	..	..	..	..	..	..	..	..	..
1½ x 1	1.0	..	1.9	..	..	..	..	..	..	..	..	..	..	..	..
1½ x [illegible]	1.0	1.4	1.9	..	..	..	..	..	..	..	..	..	..	..	..
1¼ x 1¼	1.1	1.5	2.0	2.4	..	..	..	..	..	..	..	..	..	..	..
1⅛ x 1⅛	0.9	1.3	1.7	2.1	..	..	..	..	..	..	..	..	..	..	..
1 x 1	0.8	1.2	1.5	..	..	..	..	..	..	..	..	..	..	..	..
1 x ¾	..	1.0	..	..	..	..	..	..	..	..	..	..	..	..	..
1 x ⅝	0.7	1.0	..	..	..	..	..	..	..	..	..	..	..	..	..
⅞ x ⅞	0.7	1.0	..	..	..	..	..	..	..	..	..	..	..	..	..
¾ x ¾	0.6	0.8	..	..	..	..	..	..	..	..	..	..	..	..	..
⅝ x ⅝	0.5	..	..	..	..	..	..	..	..	..	..	..	..	..	..

STRUCTURAL SHAPES. Beams. Channels. Angles. Plates. FOR PROMPT SHIPMENT

Weights of Steel Channels

Depth of Channels Inches	Weight per Foot Pounds	Thickness of Web Inches	Width of Flange Inches
3	6.00	0.362	1.162
	5.00	0.264	1.501
	4.00	**0.170**	**1.410**
4	7.25	0.325	1.725
	6.25	0.252	1.65
	5.25	**0.180**	**1.580**
5	11.50	0.477	2.037
	9.00	0.330	1.890
	6.50	**0.190**	**1.750**
6	15.50	0.563	2.283
	13.00	0.440	2.160
	10.50	0.318	2.038
	8.00	**0.200**	**1.920**
7	19.75	0.633	2.513
	17.25	0.528	2.408
	14.75	0.423	2.303
	12.25	0.318	2.198
	9.75	**0.210**	**2.090**
8	21.25	0.582	2.622
	18.75	0.490	2.530
	16.25	0.399	2.439
	13.75	0.307	2.347
	11.25	**0.220**	**2.260**
9	25.00	0.615	2.815
	20.00	0.452	2.652
	15.00	0.288	2.488
	13.25	**0.230**	**2.430**
10	35.00	0.823	3.183
	30.00	0.676	3.036
	25.00	0.529	2.889
	20.00	0.382	2.712
	15.00	**0.240**	**2.600**
12	40.00	0.758	3.418
	35.00	0.636	3.296
	30.00	0.513	3.173
	25.00	0.390	3.050
	20.50	**0.280**	**2.940**
15	55.00	0.818	3.818
	50.00	0.720	3.720
	45.00	0.622	3.622
	40.00	0.524	3.524
	35.00	0.426	3.426
	33.00	**0.400**	**3.400**

Weights in heavy print are standard, others are special

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