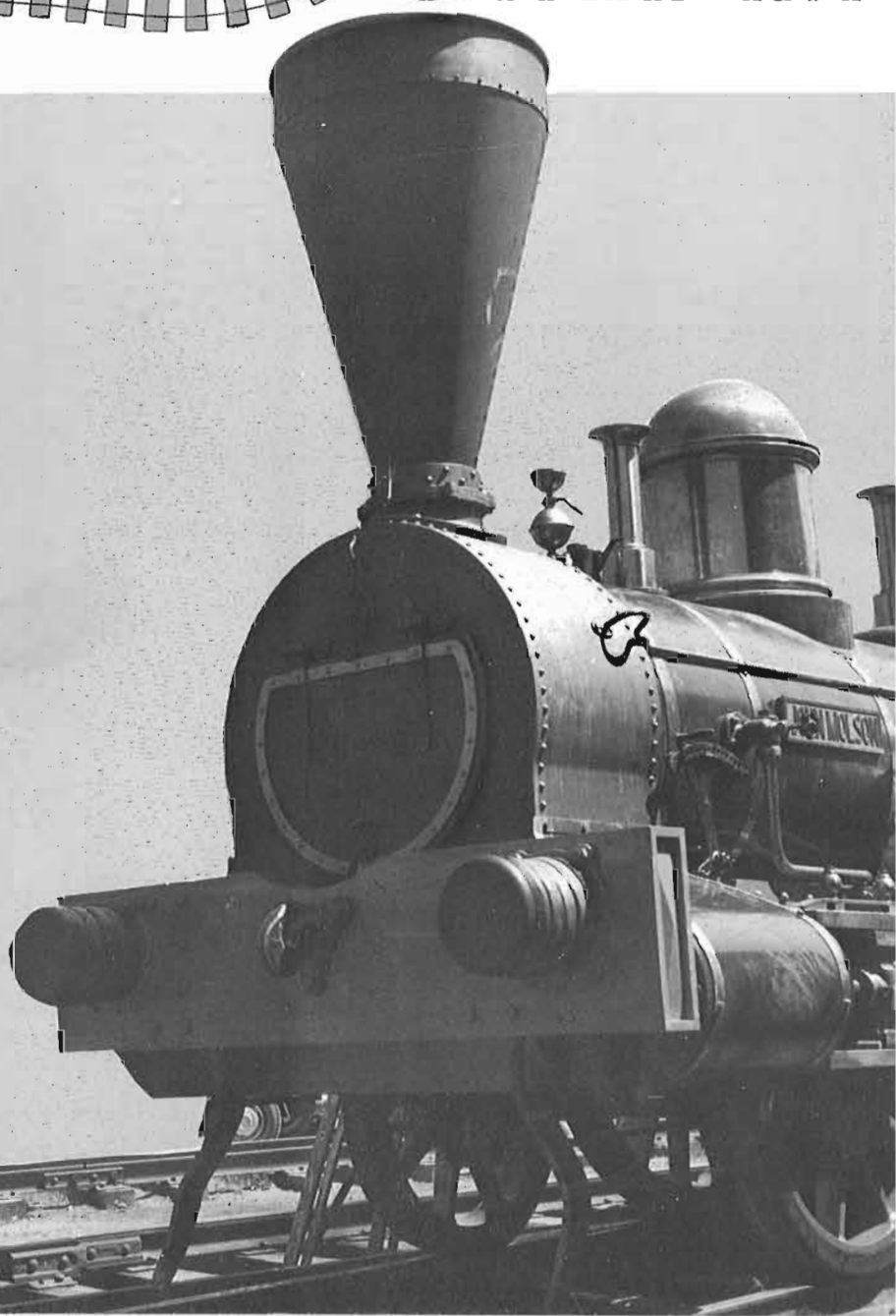


Canadian Rail



NO. 237
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THE HONOURABLE JOHN MOLSON
1763 - 1836

THE IMPOSSIBLE DREAM

The Construction of the JOHN MOLSON
of 1971.

R.V.V.Nicholls.

Editor's Preface.

If - by some incredible good fortune - any railway enthusiast were able to command the construction of a working replica of one of Canada's ancestral steam locomotives, which of - say, the first ten that ran on Canada's early railways - would he choose?

Would it be the DORCHESTER - the precursor and ancestor of them all? Probably not. The DORCHESTER was not of a unique design. Nor was she impressive in size. There are two inoperable wooden replicas of this engine in existence today, which were constructed in 1936 to a slightly questionable design, based largely on that of other, contemporary (1836) locomotives and the supplementary research - one hundred years later - of two eminent Canadian railway and locomotive historians, the late Messrs. John Loye and Robert R. Brown.

But there were no specific mechanical drawings for the DORCHESTER extant in 1936 - nor are there today - which could enable the construction of such a matriarch. Alas, this is also true of most of the early steam locomotives of Canada's pioneer railways.



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← NOTHING COULD BE MORE APPROPRIATE ON THIS MONTH'S COVER THAN A BOLD portrait of the JOHN MOLSON of 1971. Inside the front cover is a picture of John Molson the Elder, after whom the original engine was probably named. Cover by S.S.Worthen. Portrait courtesy Molson Archives.

However, there are side-elevation and cross-sectional drawings still preserved for a type of steam locomotive which it is presumed was purchased for operation on the Champlain and St. Lawrence Rail Road - Canada's first public railway - in 1849. And the intricate story of the translation of these ancient drawings into an operating replica of this locomotive is the enthralling subject which the President of our Association, Dr. Robert V.V. Nicholls, unfolds in the article which follows.

UNTIL A FEW MONTHS AGO, THE CONCENSUS OF RAILWAY historians concerning the origin of the steam locomotive JOHN MOLSON of the Champlain and St. Lawrence Rail Road in Lower Canada might have been summarized as follows:

In 1847, the Directors of the newly-formed Montreal and Lachine Rail Road Company of Montreal, Lower Canada - among whom was Mr. William Molson - ordered the purchase of three, practically-identical steam locomotives from the firm of Kinmonds, Hutton and Steel, locomotive manufacturers of the Wallace Foundry, Dundee, Scotland. The order was placed with the view of inaugurating regular passenger train service on that eight-mile-long railway, from Chabouillez Square, Montreal, westward almost parallel to the recently deepened Lachine Canal - which circumvented the famous Lachine Rapids - to the town of Lachine and the town wharf on Lake St. Louis.

The new locomotives arrived in Montreal from the Scottish builders too late (autumn of 1847 or spring of 1848) to fulfill their intended role, the railway having been opened on November 19, 1847 with an engine built by Richard Norris of Philadelphia, U.S.A. This engine had been used during the construction of the line and was therefore readily available.

It was formerly thought that very soon thereafter, the Directors of the Montreal and Lachine Rail Road realized that two of the three locomotives ordered - the JAMES FERRIER and the MONTREAL, named after the President of the Rail Road and its principal terminus respectively - would be sufficient to operate the service which was advertised. Therefore - it was assumed by historians - the Directors sold or otherwise conveyed the third locomotive - the JOHN MOLSON - to the Champlain and St. Lawrence Rail Road, the 14½-mile-long enterprise - Canada's first public railway, opened in July, 1836 - which ran between La Prairie on the St. Lawrence River and the town of St. Johns on the Richelieu River.

We now know, as a result of recent research concluded by Mr. John Beswarick Thompson - a member of the Association resident in Ottawa - on documents relating to the Champlain and St. Lawrence and the Montreal and Lachine Rail Roads, presently preserved in the National Archives of Canada, that the JOHN MOLSON was ordered directly by the Champlain and St. Lawrence.

This engine arrived in Montreal from Scotland in either July or August, 1849 - the month and date have not been established. As previously supposed, the JAMES FERRIER and the MONTREAL were ordered by the Montreal and Lachine Rail Road Company, possibly by the President, James Ferrier, when he was in Dundee, Scotland in the summer of 1847. These engines arrived in Montreal in June or July, 1848. Again, the precise date of their advent is not yet known.

One important question regarding the actual date of construction of the JOHN MOLSON still remains unanswered. While the locomotive was shipped to Canada during the summer of 1849, was she built in 1849, 1848 - or earlier? The difficulty in answering this important question definitively stems from the possibility that she may have been in "stock" at the Wallace Foundry of Messrs. Kinmonds, Hutton and Steel, when the order for her purchase was received. In those days, locomotive manufacturers were accustomed, on receipt of an order, to build one or more locomotives in excess of the number ordered, with the view to making other advantageous sales at a later date.

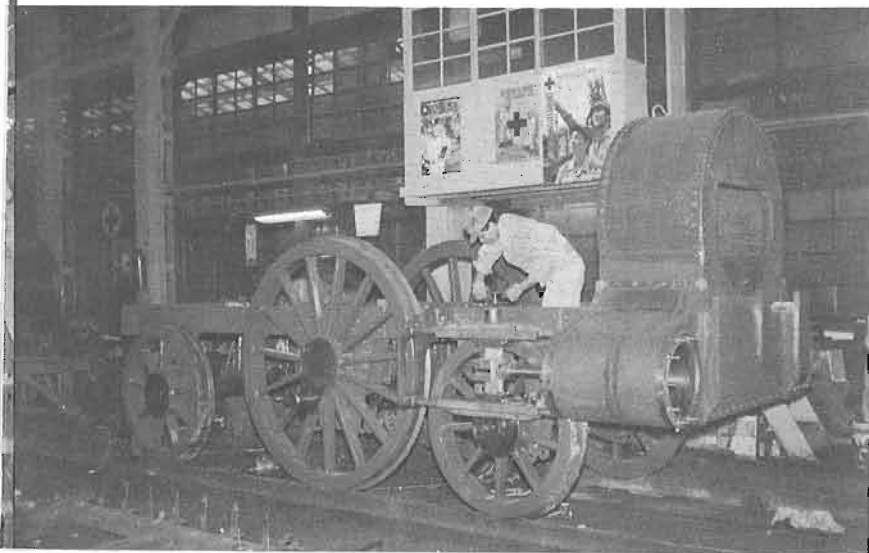
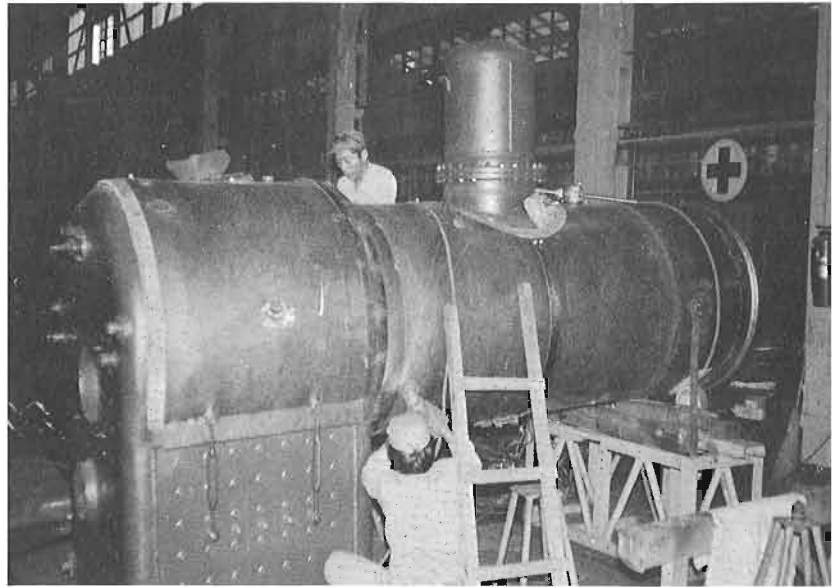
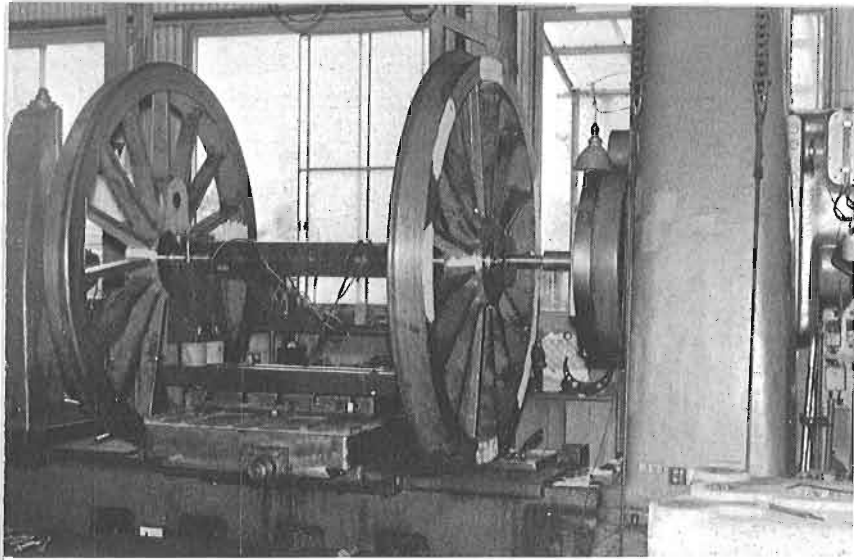
This question of the date of construction is associated with yet another puzzle. From the mid-1830's - at least - there was a company of textile machinery and steam locomotive manufacturers in Dundee, Scotland, doing business under the name of Kinmonds, Hutton and Steel, to which reference has been made above. In parenthesis, it is noted that the name "Kinmonds" is sometimes spelled in the singular, while the name "Steel" is spelled incorrectly with a terminal "e".

We know from the research of Mr. G. MacLennan Steel, a friend of the Canadian Railroad Historical Association, resident in England and a direct descendant of one of the original partners of Kinmonds, Hutton and Steel, that this partnership was dissolved in July, 1847. Partner Steel retained the Wallace Foundry. The Kinmonds - Mr. Kinmond, senior partner - had been joined by his nephews, William and Peter, and had purchased - it is believed - the Lillybank Foundry in Dundee and had continued to manufacture steam locomotives under the name of "Kinmond and Company". They continued to do so until about 1853, when the nephews - having made an exploratory visit to Canada earlier - this time travelled to Canada for good and established in Montreal, Canada's second steam locomotive manufactory under the name of "Kinmond Brothers".



STARTING FROM SHEET AND MOLTEN METAL, THE VARIOUS PARTS OF THE LOCOMOTIVE begin to take shape. The boiler is formed, the firebox welded, the cylinders poured and the driving wheels turned. At a later stage, the driving wheels are balanced, the boiler is assembled and the engine frame prepared. All pictures were taken at the Kawasaki Heavy Industries, Limited plant at Kobe, Japan and supplied by Mitsui & Company (Canada) Limited.





The second question which thus remains unanswered relates to the actual workshop in which the JOHN MOLSON was constructed. Was she built at the Wallace Foundry of Kinmonds, Hutton and Steel, or at the Lillybank Foundry of Messrs. Kinmonds and Company? Of course, these and similar questions could easily be answered if the records of the two Companies had been preserved and could be found today. As far as can be determined, they cannot be found and therefore it must be concluded that they were not preserved.

It cannot be said with certainty whether the newly-acquired steam locomotive was named after the Honorable John Molson the Elder (1763-1836), who came to Canada as a young man and was, in later years, one of the incorporators of and a principal investor in the Champlain and St. Lawrence Rail Road, or after his eldest son, John Molson the Younger (1787-1860), President of the same Company in 1848-49.

The JOHN MOLSON, like other locomotives in North America at that time, burned wood as fuel - not coke and later coal, as was the usual sequence in Great Britain and Europe. It is not known whether her grates and smokestack were originally designed for burning wood or were subsequently modified after her arrival in Canada.

It can be said with certainty that she was modified in other ways, after a year or two of service on the rail road. The principal changes which were made were the replacement of the leading, fixed pair of wheels by a four-wheeled, swivelling truck, to act as a guiding mechanism for the locomotive, as she ran over the uneven track. This installation of the leading truck in turn necessitated the inclining of the outside cylinders, to afford the clearance necessary in negotiating the curves. Finally, a headlight, bell and primitive cab were also installed.

In 1927, the late Mr. John Loye, first president of the Association and dedicated railway historian, drew a sketch of the JOHN MOLSON, after her modification in the manner described above. He showed this sketch to the late Mr. H.A. Pangborn, who had, in his youth, seen the locomotive many times. Mr. Pangborn affirmed that the sketch represented the locomotive as he remembered her.

The late Mr. Robert R. Brown, an authority on Canadian railways and long-time member of the Canadian Railroad Historical Association, was of the opinion that the JOHN MOLSON, with her single pair of 66-inch drivers, was a very fast locomotive; though, perhaps, not very powerful and rather prone to slipping of her driving wheels. Between 1852 and 1857, the JOHN MOLSON was assigned to the fast mail train from St. Lambert - on the south shore of the St. Lawrence Ri-

ver, opposite Montreal - to Rouses Point, U.S.A., just south of the International Boundary. The distance was 42 miles and the scheduled time was 75 minutes for the run, including three stops for wood and water!

In 1857, the Champlain and St. Lawrence Rail Road Company and the Montreal and New York Railroad Company - the latter having been formed in part from the Montreal and Lachine Rail Road - amalgamated and took the new corporate title of the Montreal and Champlain Railroad. For a time, the JOHN MOLSON was assigned to the Stanstead, Shefford and Chambly Railway - a 28-mile long line from St. Johns to (West) Farnham and Granby (1859) and Waterloo (1861) - when it was operated by the Montreal and Champlain, under lease.

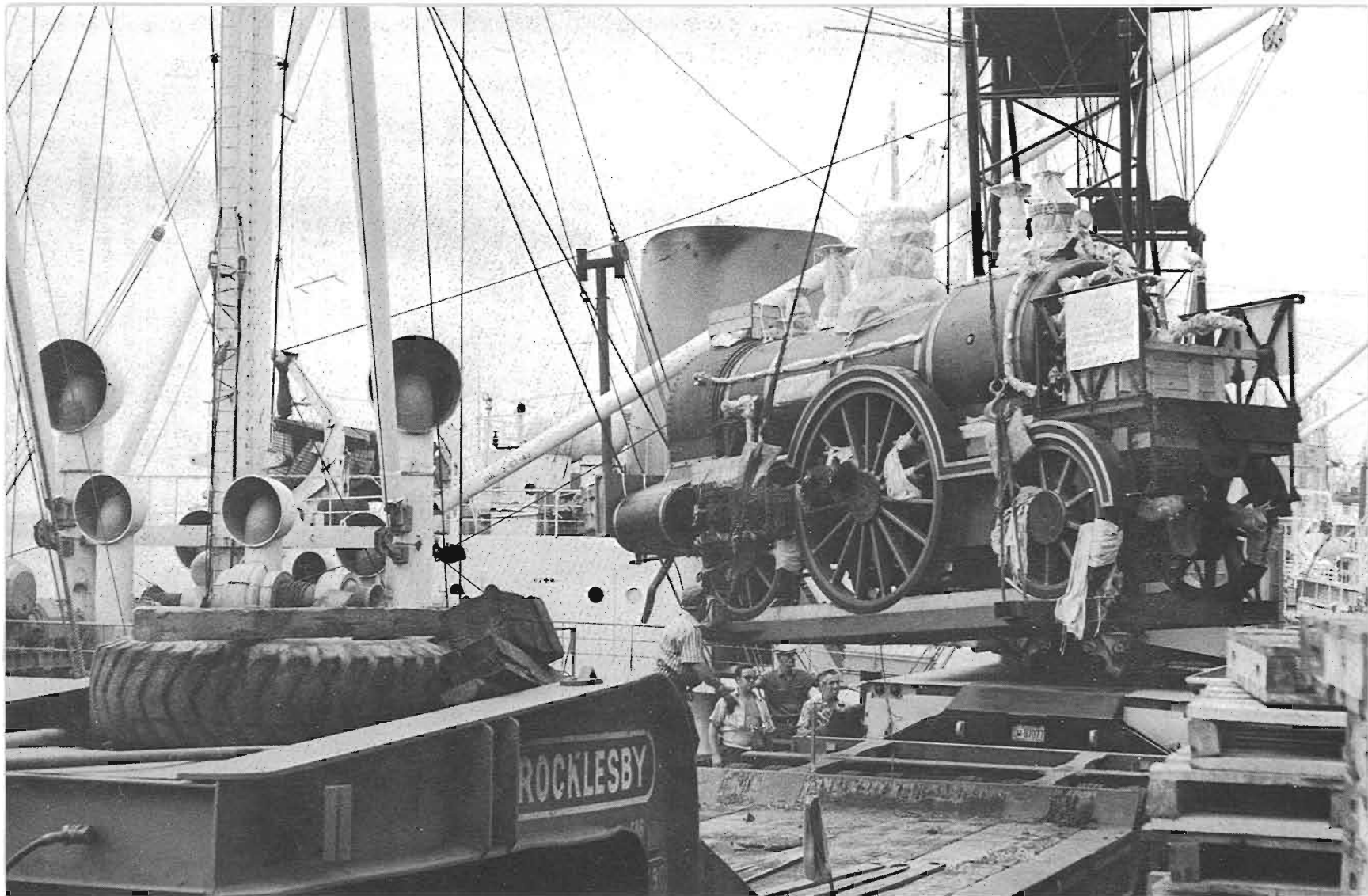
The JOHN MOLSON - a truly historic steam engine - is thought to have ended a life of useful service in 1874 on the Lachine Division of the Grand Trunk Railway Company of Canada. This Company had leased the Montreal and Champlain Railroad in 1863 and had purchased it ten years later.

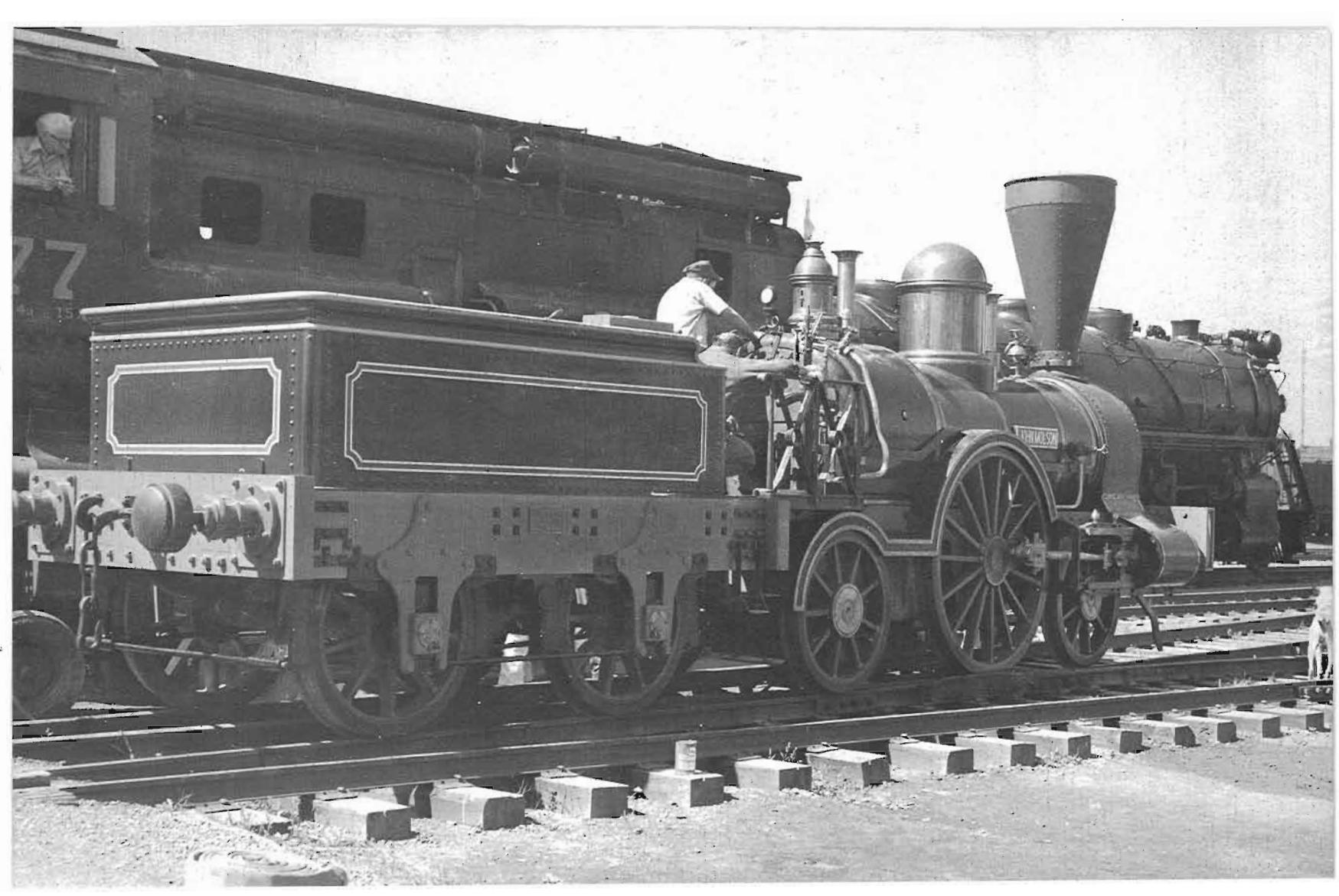
Thus, the JOHN MOLSON operated on no fewer than four early Canadian railways, including the first - the Champlain and St. Lawrence - as well as the first line to be built to and terminate in the City of Montreal: the Montreal and Lachine Rail Road.

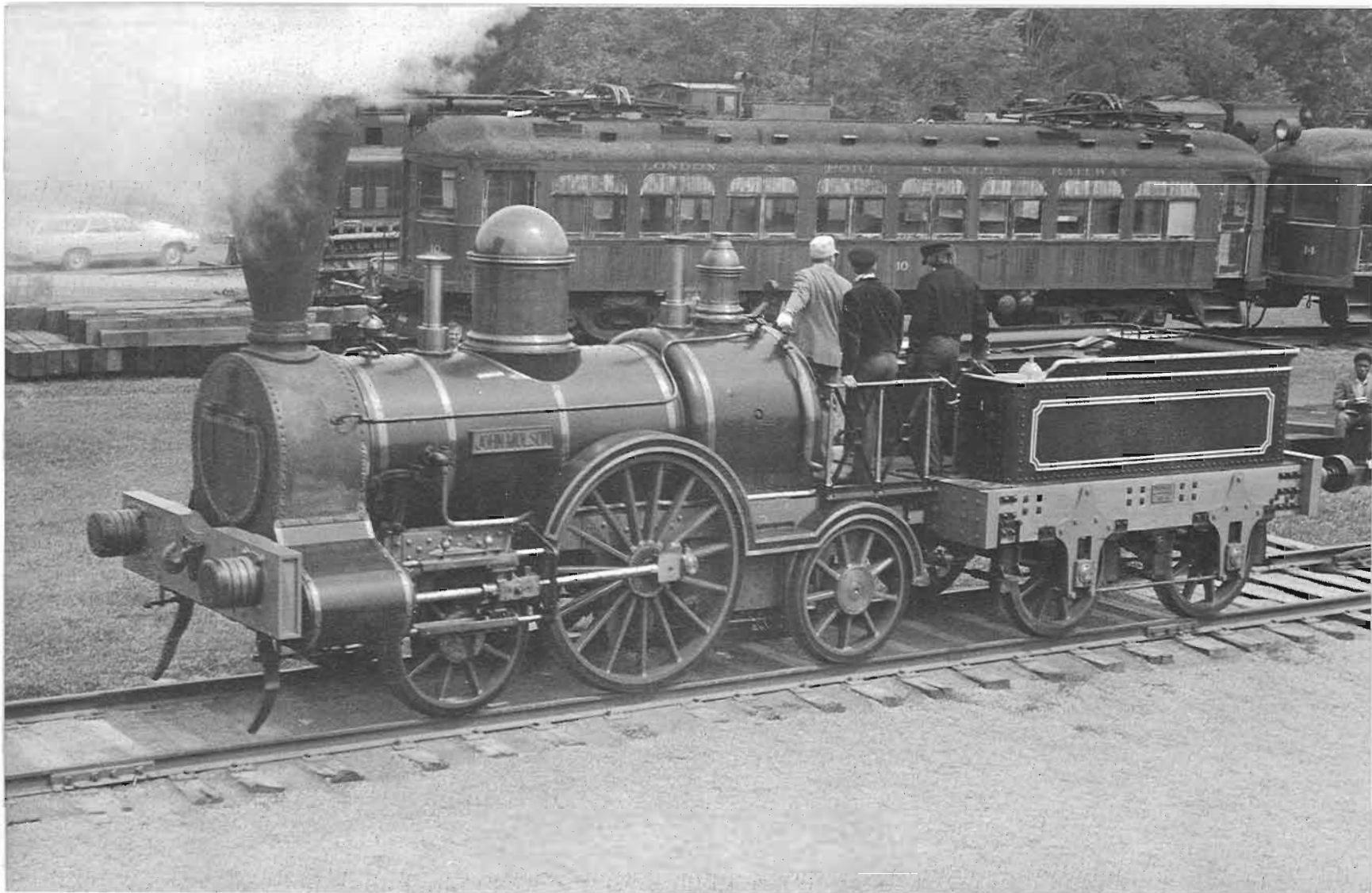
Only two locomotives which were built prior to 1870 - the approximate date when all major Canadian railways were standardized to the Stephenson Gauge of 4 feet 8½ inches - and which operated on a railway in Canada - have survived to the present day. These are the SAMSON of 1838 and the ALBION of 1854, both of which ran on the coal railways of the General Mining Association in Nova Scotia. Both are preserved today as static displays in Pictou County, Nova Scotia.

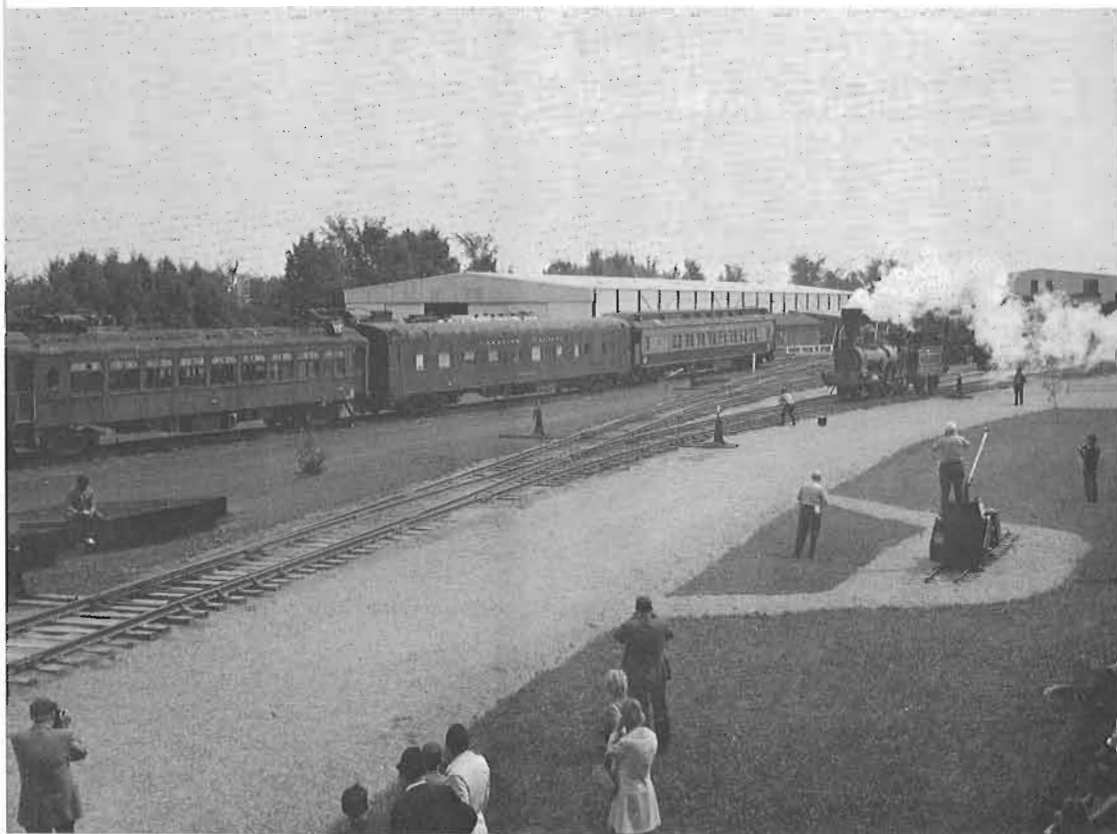
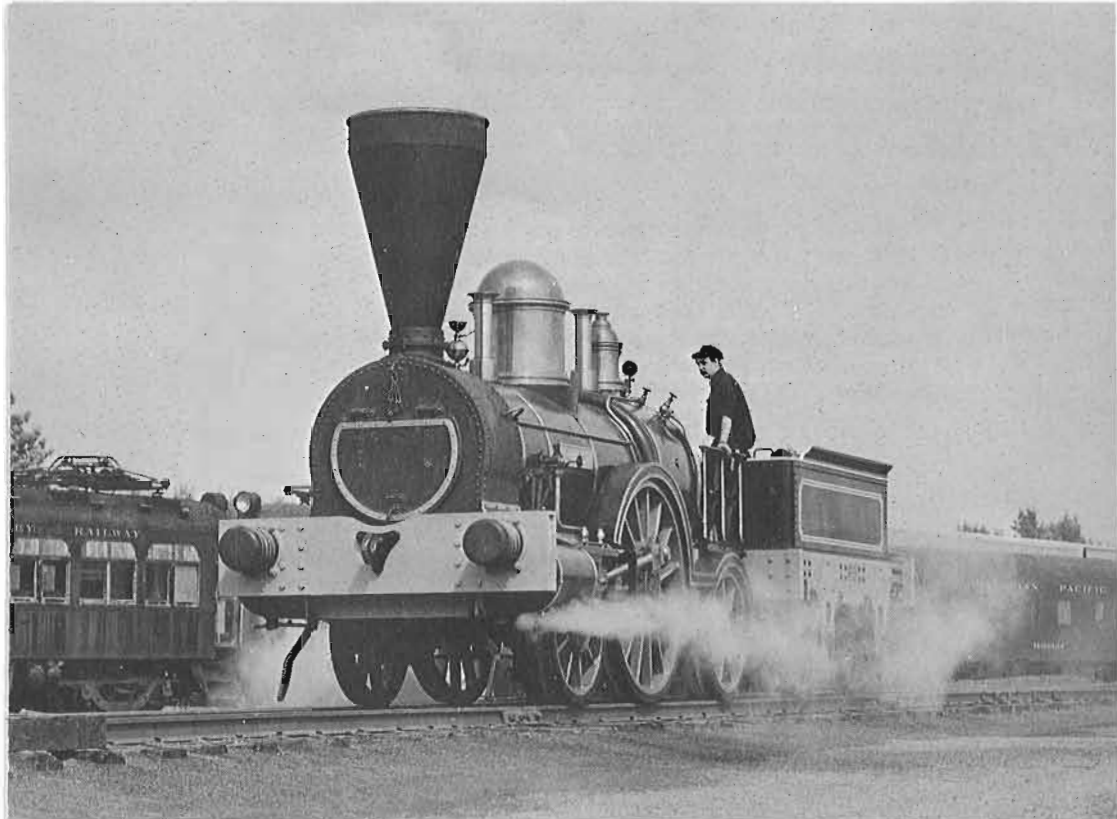
It should be mentioned in passing that two, non-operable replicas of Canada's first steam locomotive for a public railway - the DORCHESTER of 1836 - are in existence. One is exhibited in the Chateau de Ramezay, Montreal - being the work of the late Messrs. John Loye, Robert R. Brown, William G. Cole, Thomas O'Dowd and others, charter members of the Canadian Railroad Historical Association. The other is on view at the Maison La Salle, City of Lachine, Québec.

Soon after the establishment of the Canadian Railway Museum - Musée Ferroviaire Canadien by the Canadian Railroad Historical Association, much profound consideration was given to the creation of a suitable exhibit or exhibits, to demonstrate the development of the railways of Canada before the 1870-era, the period reflected by the oldest steam locomotive then preserved at the Museum. During









1962-63, proposals were progressively eliminated and refined to fix finally upon the possibility of constructing a full-scale, operable replica of a steam locomotive of the 1840's. Gradually, all other proposals were eliminated and the steam locomotive JOHN MOLSON began to emerge as the choice. This selection was preferred because of several important considerations.

First, the JOHN MOLSON was of the right "vintage" - the late 1840's.

Second, the wheel arrangement - 2-2-2 - was probably the most popular type of the late 1830's, '40's and early '50's. In perhaps eight European countries, rail transportation was inaugurated with locomotives of this wheel arrangement.

Third, the single-driver steam locomotive is of a particularly handsome design, to which any student of the former Great Western Railway of England will attest.

Fourth, the JOHN MOLSON ran on several important pioneer Canadian railways.

Fifth, the JOHN MOLSON was practically identical to two other famous locomotives, the JAMES FERRIER and the MONTREAL.

Finally, a potential source of financial aid to realize the construction of a working replica of this 2-2-2 locomotive appeared to be available.



THE LOCOMOTIVE REPLICA IS OFFLOADED FROM THE M/V MIKAGESAN MARU BY THE crane of Sicotte Transport onto a low-bed trailer. Photo A.S. Walbridge. The next day, the engine was cautiously fired up at the Canadian Railway Museum under the watchful eye of Dr. Nicholls. Photo S.S. Worthen. On August 14, 1971, Senator Hartland de Montarville Molson took the throttle of the JOHN MOLSON of 1971 for the inaugural run. Photo S.S. Worthen. Tom Montgomery's photograph of the JOHN MOLSON of 1971, with Peter Layland at the throttle, has received the widest publicity of any picture. The JOHN MOLSON of 1971 steams forward at the Canadian Railway Museum on August 14, 1971 - Members' Day at the Museum. Photo S.S. Worthen.

The builder's plate - which is firmly affixed to the frame of the tender. Photo Tom Montgomery.



As soon as the Directors of the Canadian Railroad Historical Association took the decision to proceed with further study of this exciting proposal, they were immediately confronted with three major problems requiring resolution. The first objective was to find a donor or group of donors who would provide the essential financial means, then estimated - in all naiveté - to be of the order of \$ 10,000. Clearly, the construction of an exact replica of a steam locomotive of the 1840's would be costly; the machine, though primitive, being nevertheless complex.

The construction methods by which the original had been built, are today extinct. It would be impossible to secure any cost reduction through the use of modern mass-production techniques. Moreover, any person or consortium who agrees to provide financial assistance to a project seldom writes a blank cheque. He naturally wishes to know how much money he will be expected to give.

The provision of this vital information was dependent upon the successful resolution of two additional problems.

Given the money - in any amount - the construction of a replica of a steam locomotive requires a set of working mechanical drawings. Without these, all the money in the world could not buy such a machine. Moreover, it was necessary to find or produce a set of authentic mechanical drawings in order to obtain serious bids from potential manufacturers. How could such drawings be created, approximately one hundred and twenty years after the company which built the original locomotive had been dissolved?

By the summer of 1964, following the failure of several competent and energetic historians in Great Britain to locate any of the records of the Kinmond companies, with very mixed feelings, the conclusion was reached that a set of working drawings would have to be produced starting with sheets of blank paper. This was truly a very dismaying prospect.

At this juncture - and as a result of other correspondence with Mr. G. MacLennan Steel of England on the Canadian activities of the Kinmond Brothers of Montreal - the attention of the Directors of the Association was happily drawn to an engraving - actually a montage of etchings - displayed at the Dundee Museum, Dundee, Scotland. This montage showed a Kinmonds, Hutton and Steel 2-2-2, outside-cylinder steam locomotive of 1848. Incredible but true, this etching was appar-

ently used by the Company to advertise its current (1843) product! Upon comparison, the design was found to agree well with information in the Report to the Board of Railway Commissioners (Canada) of Mr. Samuel Keefer, Inspector of Railways - of 1859, a work which still exists in a few copies. This report gives some details respecting steam locomotives then operating in Canada. In addition, the etching from the Dundee Museum resembled the locomotive shown in a sketch of uncertain date by a Mr. J. Walker, captioned "The First Train to Come into Montreal".

Early in 1965, an adequate core of information then being at hand, an attempt was made to prepare a preliminary set of plans, estimated to number between 100 and 150 separate drawings, when completed. This ambitious project was undertaken by a team of member-draughtsmen of the Association. Not surprisingly - in view of the terrible complexity of the project - it proved abortive. A year had passed and no progress had been made.

During this interval, the Curator of the Dundee Museum suggested that the project might be discussed with Mr. William Gordon Small, talented instructor of draughting at Alloa Academy, Alloa, Scotland. In addition to his skill as a draughtsman, Mr. Small was also an expert on early Scottish railway locomotives and an ardent builder of live-steam models. By this most extraordinary and fortuitous turn of good fortune, the project was once again revived.

In March, 1966, Mr. Small very generously volunteered to prepare the numerous essential drawings in his spare time and as a "labor of love". He worked with such enthusiasm and to such good effect that the drawings were ready in November of the same year.

The intervening weeks had generated a voluminous correspondence between Scotland and Canada, as innumerable decisions were taken respecting the details of the design. Everyone concerned with the project kept the original objective constantly in mind: to build in the 1960's a working replica of a steam locomotive, which would duplicate as closely as possible an original, built in the 1840's.

Some deviations from the original design had to be accepted, chiefly in order that the replica, when complete, would be acceptable to the inspection authorities of the Province of Québec, who are responsible for the safety of boilers and other pressure vessels. This requirement was essential if the locomotive were ever to oper-

ate at the Canadian Railway Museum. Moreover, the completed locomotive must also be acceptable to the insurance underwriting company which would subsequently insure the locomotive for operation, thus assuming the burden of responsibility for the design and construction. Without an acceptably constructed locomotive, subsequent unconditional operation would be impossible.

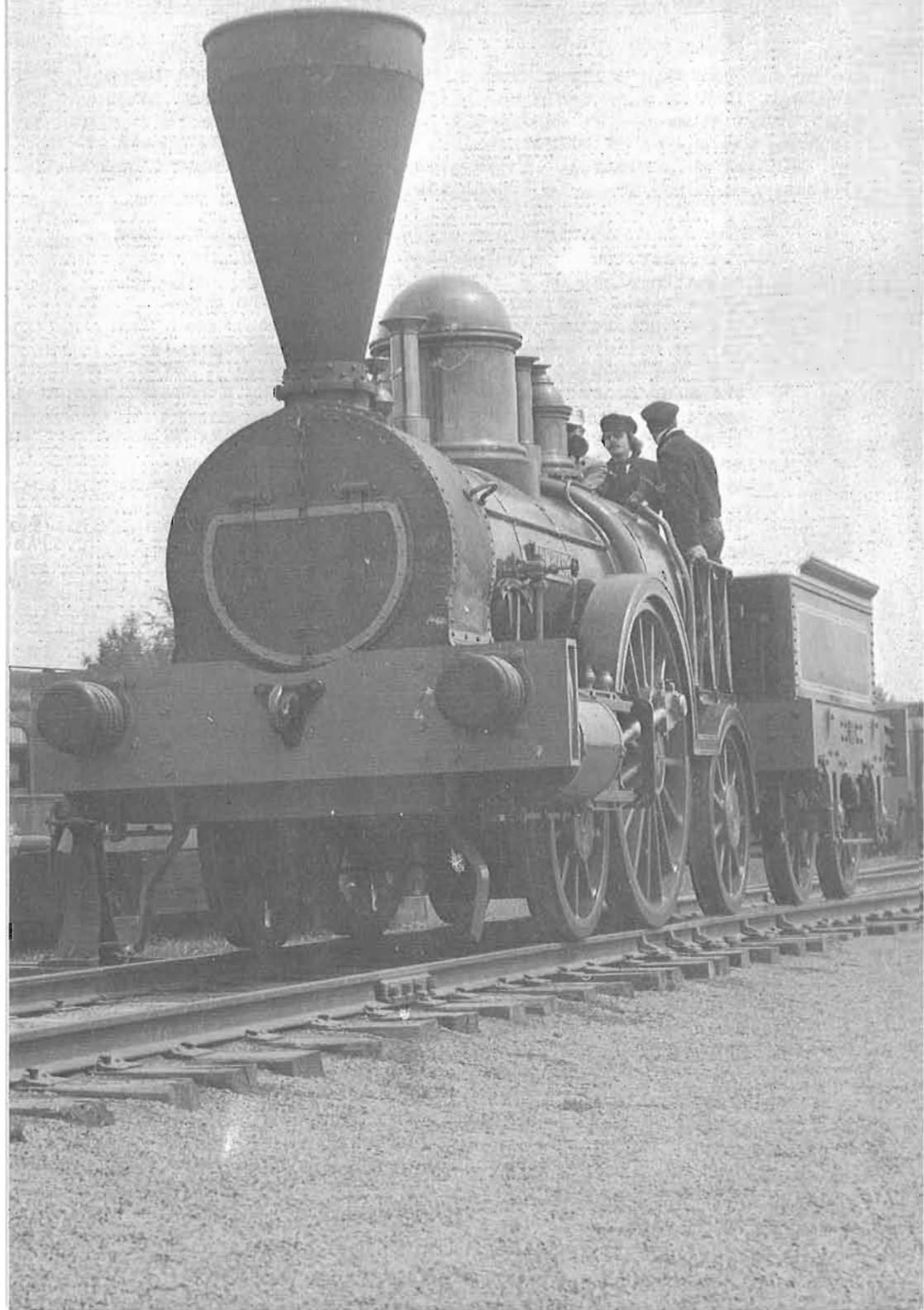
Among the modifications necessitated may be mentioned the provision of a welded-steel boiler with steel tubes in place of a rivetted-copper boiler with brass tubes. The antique safety valve - the primitive "pop-valve" to relieve the steam pressure in the boiler - gave way to two modern safety valves. The hoary Salter Valve - an early type of steam-pressure gauge - was supplemented by a modern dial gauge on the boiler backhead. Two modern injectors were installed to provide a dependable source of boiler feed-water. By ingenious design, most of these variations were cleverly hidden from view. Finally, to facilitate the rapid raising of steam and to minimize air-pollution in compliance with emergent provincial and municipal regulations, the specification of wood as the fuel was amended to stipulate oil.

Now that the drawings had been created from which estimates of construction costs would be prepared, it remained to find - somewhere in the world - a builder of steam locomotives. And having found such a company or consortium of companies, to persuade them to consider the construction of an authentic, operable replica of the steam locomotive JOHN MOLSON of the forgotten 1840's.

After 1960, builders of steam locomotives throughout the world had begun to decline in number. The search, initiated during the summer of 1964, was - for reasons of sentiment - conducted most fiercely in Great Britain. During the next two years, its scope was necessarily broadened to include France, West Germany, Canada and the United States.

The results of each search were generally the same: lack of capability or lack of interest; quotations of very high prices, which could be considered equivalents to expressions of disinterest. It seemed that most companies which had the capabilities did not have the interest. But just when the hope of completing the project had reached a very low ebb, fortune began to smile and interest was awakened in a very distant land.

A young and extremely energetic member of the Association, resident in Japan, expressed his willingness to try to find in that country a competent and willing manufacturer of steam locomotives.





JOHN MOLSON

Mr. William D. McKeown, formerly of Ottawa, Canada and then working for the Young Men's Christian Association in Osaka, Japan, at once began the search which was to last for four years. It was fraught with uncertainty and punctuated with disappointment. A full understanding of what was involved in this protracted search must necessarily await Bill McKeown's return to Canada, else the entire interval would be consumed with the writing of this revelation.

Having apparently exhausted the possibilities of steam locomotive construction in most other countries of the world, all the remaining energies of the project planners were now devoted to the consummation of an arrangement with a Japanese builder. Help was sought wherever it could be found. It is probable that, at one critical juncture, the Japanese National Railways intervened to assist in the successful realization of the Canadian Railroad Historical Association's proposal.

Finally, in the last days of 1968, a consortium of three Japanese companies - Mitsui and Company; Kawasaki Rolling Stock Manufacturing Company; Kyosan Industrial Company - submitted a bid for the construction of a working replica of a locomotive of 1848, which, when modified, was acceptable to the Canadian Railroad Historical Association. And it was so accepted on December 30, 1969.

It called for the completion of a working replica of the steam locomotive JOHN MOLSON within sixteen (16) months of the final approval of the working drawings and shipment thereafter to Montreal for an all-inclusive price of \$ 75,000.

Concurrently, the Association was remarkably fortunate to find a generous donor who agreed to underwrite the cost of the project.

The difficult and prolonged search for a builder for the JOHN MOLSON of 1971 was not without its advantages. The period provided an interval, from late 1966 to 1969, for Mr. Gordon Small's drawings and specifications for the replica to be re-examined and scrutinized several times - on at least two occasions by independent experts on the history of the steam locomotive and its construction, resident in both Great Britain and Canada. In this connection, the Canadian Railroad Historical Association is indebted to Mr. Jack Hewitson and Mr. Eric Sprenger, both of Montreal, Canada.



DRIVER PETER LAYLAND AND STOKER IAN WEBB, DRESSED APPROPRIATELY IN MID-nineteenth century railwaymen's costumes, parade the JOHN MOLSON of 1971 before the Association members on August 14, 1971. Photo S.S. Worthen.

Senator Hartland de M. Molson - great-great-grandson of John Molson the Elder (1763-1836) - poses for his portrait with the JOHN MOLSON of 1971. Photo by Robert Nadon - LA PRESSE.

To permit the entry of the completed replica into Canada, exempt from customs import duties and taxes, application was made to the Government of Canada for an exemption and it was, in due course, granted.

In the weeks that followed the signing of the contract for construction of the replica, late in 1969, Mr. S. Hirota, mechanical engineer of the Kawasaki Rolling Stock Manufacturing Company and his associates, prepared a second set of engineering drawings - much more detailed than the original set - with dimensions in the metric system, rather than in the English system, normally used by western engineering firms - and annotated in the Japanese language, so that they could be readily understandable by the engineers and artisans of the Kawasaki firm and the Kyosan Industrial Company at Fukushima.

The creation of the second set of drawings initiated a three-way correspondence between Canada, Japan and Scotland. The Japanese builders are to be complimented on the patience, understanding and diligence with which they consummated the transmutation of the design drawings into terms which could be readily understood in their workshops.

By February, 1970, it had become apparent that a face-to-face meeting between Mr. S. Hirota and Mr. W. Gordon Small was essential, in order to reach agreement on many of the remaining details of the locomotive's design. Accordingly, the Canadian Railroad Historical Association was able to bring Mr. Small from Scotland to Canada and the Mitsui, Kawasaki and Kyosan Companies sent Mr. Hirota from Osaka. A two-day meeting in Montreal between designer and engineer ensued. At the end of the discussions, the result was the finalization of the working drawings for the JOHN MOLSON of 1971.

Construction of the replica began soon thereafter. As the building of the locomotive and tender proceeded during the summer of 1970, so did the inspection of the components employed. This inspection was essential as a prerequisite to the granting of the certificate from the insurance underwriters and the boiler and pressure-vessel inspector of the Province of Québec. The completed boiler and firebox were subjected to the same careful scrutiny.

The replica of the JOHN MOLSON of 1848 was given an operating test on November 10, 1970, in the presence of Mr. William D. McKeown and Mr. R.H. Jones - the latter a mechanical engineer for CP SHIPS, who had consented to act on behalf of the Association - representing the Canadian Railroad Historical Association.

This operating test was generally satisfactory, but it was considered advisable to strengthen the firebox somewhat, so that

it would meet the most stringent requirements of both the insurance underwriters and the boiler inspection services of the Province of Québec. The necessary improvements were made and a final certification was approved on June 18, 1971.

Eleven days later, the JOHN MOLSON of 1971 was loaded on the deck of the freighter "Mikagesan Maru" of Mitsui O.S.K. Lines, Limited and left the Port of Yokahama, bound for Montreal, via the Panama Canal. The ship was expected to dock at the Port of Montreal during the morning of Monday, August 2, 1971, but as the morning passed, the news was received that the ship had been delayed by fog and would arrive about twenty-four hours later.

The "Mikagesan Maru" arrived in the Port of Montreal early on the morning of Tuesday, August 3 and by that afternoon, the JOHN MOLSON of 1971 had been unloaded and moved by highway low-bed transport trailer to Saint-Constant, Québec and the Canadian Railway Museum-Musée Ferroviaire Canadien.

During the long voyage from Japan, only the exterior paint and bright-work had been dulled somewhat by the salt ocean spray, despite the protective coating of grease which had been applied prior to her departure.

The intervening days between the arrival of the locomotive at the Museum and her first operation in Canada were occupied with cleaning the boiler and tender and installing the smokestack and copper steam-dome cover. On Saturday, August 7, 1971, preparations were made to steam up the JOHN MOLSON of 1971 for the first time in Canada, for final inspection and ratification for operation by the insurance underwriters and the Inspector of Boilers, Province of Québec.

Accordingly, in the presence of Mr. T.S. Leighton, Senior Principal Surveyor for Canada and Mr. T. Ross - both of Lloyd's Register of Shipping - and Mr. F.E. Bourque, Director, Pressure Vessel Department, Department of Labor, Province of Québec, at 3.12 p.m. on August 7, 1971 - steam having been raised in a somewhat leisurely and complicated fashion - the regulator (throttle) of the locomotive was cautiously moved from the position "shut" towards the position "open" jointly by Mr. William Gordon Small and the Author and the JOHN MOLSON of 1971 moved forward, smartly and smoothly, for her first trip on the rails of a railway in Canada, just as her predecessor had done, one hundred and twenty-two years before.

This final episode in the last act of the seven-year drama took place before the eyes of many admiring members and a few mystified visitors to the Museum.

Probably no one present at this informal but historic ceremony had the sense of satisfaction that was the particular feeling of Mr. W. Gordon Small, instructor in draughting at Alloa Academy, Alloa, Scotland, who had come to Canada only two days before to participate in this memorable event. An exception to this exclusive pleasure might be granted in behalf of the Author of this article!

The operating replica of the JOHN MOLSON of 1848 of the Champlain and St. Lawrence Rail Road - Canada's first public railway - was thereafter placed in her permanent home in Bay 3 of Building 1 at the Canadian Railway Museum - Musée Ferroviaire Canadien, there to await her formal acceptance, exposition and placement in service one week later, on the occasion of a Members' Day, organized to commemorate the Tenth Anniversary of the foundation of the Canadian Railway Museum - Musée Ferroviaire Canadien and the advent of the JOHN MOLSON of 1971.

The impossible dream of 1964 had become the incredible reality of 1971.



THE CANADIAN RAILROAD HISTORICAL ASSOCIATION wishes to acknowledge the unique contribution made by the following persons in the realization of the project to construct a working replica of a steam locomotive of the 1840's in the 1960's:

- Mr. William D. McKeown, Association Representative,
Osaka, Japan.
- Mr. W. Gordon Small, Head, Industrial Arts Department,
Alloa Academy, Alloa, Scotland.
- Mr. Shoichiro Hirota, Chief Designer, Kawasaki Heavy
Industries, Osaka, Japan.
- Mr. Robert H. Jones, Superintendent Engineer, CP SHIPS,
Canadian Pacific Limited, Tokyo, Japan.
- Mr. T. S. Leighton, Senior Principal Surveyor for Canada,
Lloyd's Register of Shipping, Montreal.
- Mr. T. N. Ross, Principal Engineer Surveyor for Canada (ret.)
Lloyd's Register of Shipping, Montreal.
- M. F. E. Bourque, Director, Department of Labour and Manpower
Government of Québec, Montréal.
- Mr. M. Nakayasu, Manager, Machinery Department,
Mitsui & Company (Canada) Ltd., Montréal.
- Mr. John Doyle
The A. W. W. Kyle Company Limited, Montréal.

DESIGNING THE 'JOHN MOLSON' OF 1971

W.Gordon Small.

I SN'T THAT NICE", I SAID TO MY
wife one day in June,
1965. "John Robertson
has written to us from
Montreal".

The letter, with its Canadian stamp, was post-marked "Montreal", but it was not from my friend, John Robertson. Instead, it was a communication from the Canadian Railroad Historical Association, requesting information on three steam locomotives that had been built by the firm of Kinmonds, Hutton and Steel of Dundee, Scotland in 1846.

These three steam locomotives were said to have been shipped in parts to Montreal, Lower Canada, in 1848-49, for operation on the Montreal and Lachine Rail Road - the first railway on the Island of Montreal.

Previously, Dr. Robert Nicholls, President of the Association had written to Mr. A. Browning, Curator of the Glasgow Museum & Art Galleries for this information. Remembering that I was then constructing a 1/12-scale model of the locomotive WALLACE - the first steam locomotive on the Dundee and Arbroath Railway - Mr. Browning referred Dr. Nicholls to me. Since the WALLACE was built by the firm of Kinmonds, Hutton and Steel - as was the JOHN MOLSON for the Champlain and St. Lawrence Rail Road - Dr. Nicholls initiated my involvement in the search for the design of the JOHN MOLSON.

Initially, all that was asked for was information. But as the correspondence developed, I was asked to do a few drawings to illustrate what the locomotive might have looked like. This was to enable interested companies to have an idea of what they might be requested to quote on. However, it soon became apparent that the companies which were approached would not quote prices without working drawings. These now needed to be produced. Having never tackled a job of this magnitude, the proposal required a good bit of thinking on, but at last I decided to chance my neck and have a bash at it!

Fortunately, the bulk of the research on the steam locomotives manufactured by Kinmonds, Hutton and Steel had been done when the WALLACE of the Dundee and Arbroath Railway was started. Now it was a question of how the JOHN MOLSON differed from the other locomotives which had been built for the Dundee and Arbroath, as well as those constructed for the Glasgow, Paisley, Kilmarnock and Ayr - another early Scottish railway - some ten engines in all.

The obvious differences were in the type of funnel, the siting of the steam-dome, the pressure gauge and the safety valves. The valve gear had been improved upon to the Gooch gear, replacing the gab gear used on the earlier locomotives.

As the locomotive was to be a working replica, consideration had to be given to various existing governmental regulations relating to steam boiler design.

These regulations also made the tender-drawbar attachment to the boiler backhead - used in the original locomotive - quite unacceptable. The wheel-tyre sections on the original were much too thin and these had to be increased to modern sections. Above all, these and all other modifications had to be incorporated in the replica in such a way that they would not alter the exterior appearance of the finished machine.

The only record of steam locomotives of the JOHN MOLSON type, in drawing form, was an old engraving. This included drawings of an elevation, sectional elevation and four sections, done to $\frac{1}{2}$ -inch to 1 foot scale. When sizes from one view were lifted and compared with the same size on another view, it was discovered that the engraving was quite wrong. Apparently, the engraver had exercised considerable artistic licence in his interpretation. Nevertheless, this was a good general guide for the general arrangement of things.

In order to begin a project of this nature, not only must all possible information regarding the machine be collected, but the designer must imagine that he is working with the people who originally constructed the machine. He must keep in mind the methods and materials available at the time. He must know about the machine tools then available and the accuracy and tolerances to which these builders could work.

The construction techniques then used for building steam engines differed greatly from those of the second half of the twentieth century. Obviously, a greater proportion of the iron-work was forged, while today, cast steel or welded fabrication is the rule. The



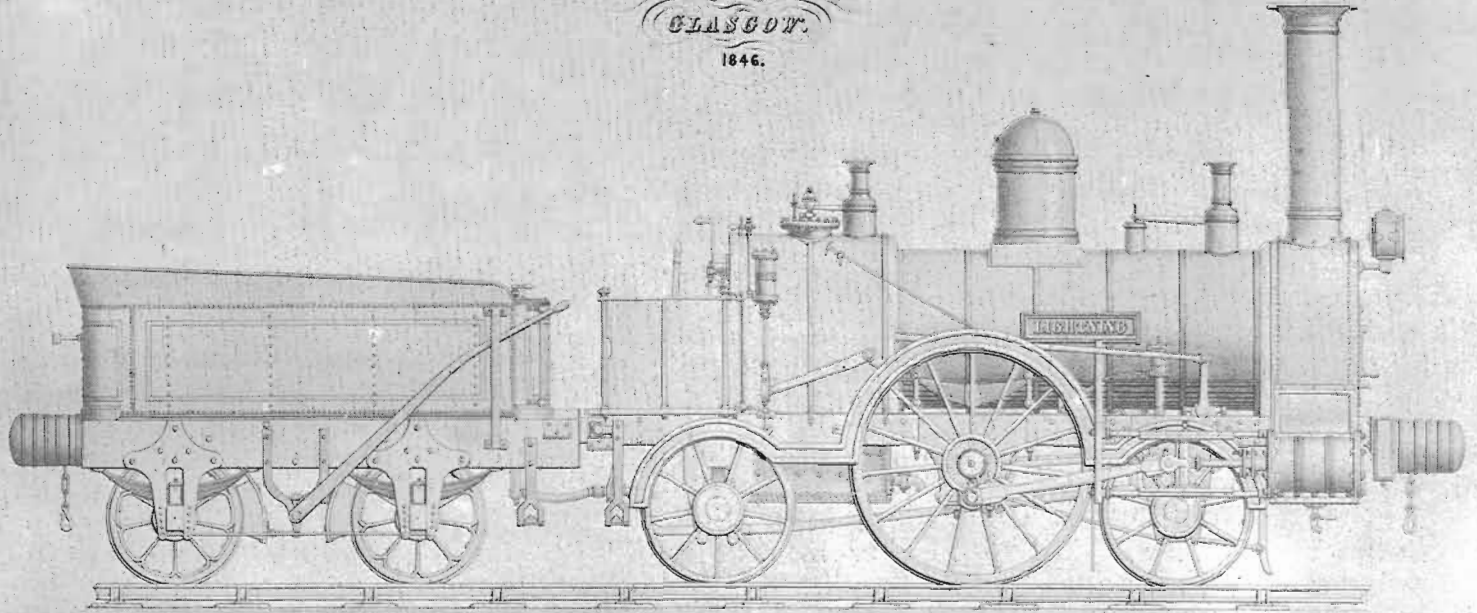
N A TYPICAL 2-2-2 LOCOMOTIVE OF THE 1848 PERIOD, IN THIS CASE CONSTRUCTED by the Glasgow, Paisley, Kilmarnock & Ayr Railway of Scotland. Photo CNR.

The montage of drawings of a 2-2-2 locomotive, designed by Kinmonds, Hutton & Steel, Engineers, Dundee, Scotland. Courtesy R.V.V. Nicholls.

Glasgow, Paisley, Kilmarnock & Ayr Railway Company.

MAKERS
GLASGOW.

1846.



KINMONDS, HUTTON & STEEL.

ENGINEERS, DUNDEE.

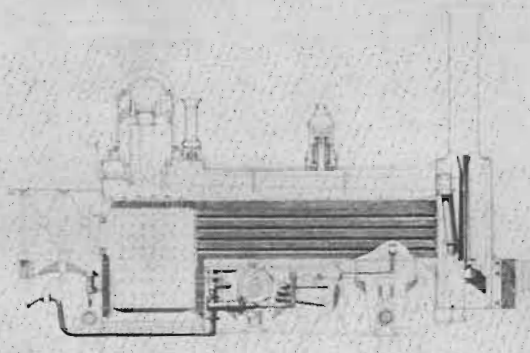


Fig. 1

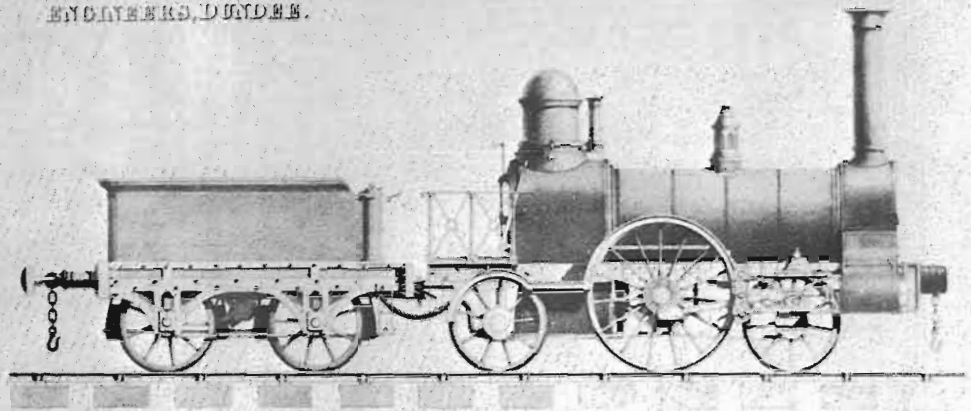


Fig. 2

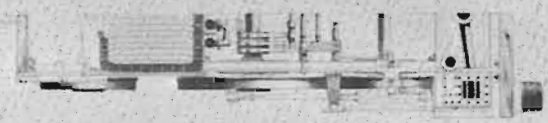


Fig. 3

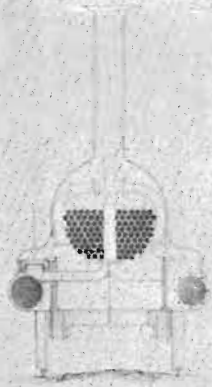


Fig. 4

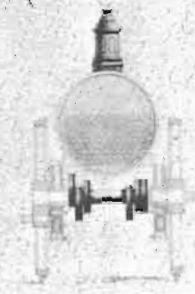


Fig. 5



Fig. 6

wheels of the first JOHN MOLSON were forged and hammer-welded, which is a technique now long lost. To form a wheel, a block of iron was used for the hub and from it spokes were drawn out for about one-third of their total length. The remainder of the spoke and the inner rim of the wheel were U-shaped sections, hammer-welded together and then hammer-welded to the centre section. Around this was hammer-welded the wheel rim. When complete, the unit was machined and then tyred.

By studying these points carefully, it is possible to assess the type of finish which could be expected from the builders of the period. It is quite obvious that if the finish on the locomotive was too modern, then the impression of a "period" machine would be completely lost.

Once all of the information and construction detail had been collected, the drawing proper could be started by drawing a full elevation, plan and end-views. These determined all the major dimensions: lengths, heights, wheel-centres, etc. These major dimensions were then used as the basis for the breakdown drawings of the various components. Frames, cylinders, valve-gear, boiler, etc. were drawn. The components, in turn, were then broken down into individual parts, each being detailed with dimensions, finishes, clearances and so forth. All the drawing sheets had an index list, giving the Part Number, No. off....., material, British Specification Number and overall sizes of raw materials required.

The drawings were all done on tracing paper of 120-gram weight, in order that prints could be taken off. This part of the job was the most time-consuming and, as reference had to be made all the time to previous sheets to check sizes, it was necessary to convert our spare bedroom into a temporary drawing office for the 10 months required to complete the bulk of the drawings. The bed was an ideal place to spread out the large sheets.

When no details of a part could be found, old books on engineering were consulted. An example is Mr. D.J. Clark's "Railway Machinery", which has excellent illustrations of various parts. By finding the necessary part of the same decade, it was possible to incorporate it into the drawings for the replica, as there is - in general - very little difference between one firm's parts and those of another at any given period.

Stress calculations did not figure prominently in the design, as modern materials to be used have a much greater ultimate tensile strength than those used originally. In fact, when the drawings were discussed with Mr. Shoichiro Hirota of the Kawasaki Rolling Stock Manufacturing Company, he recommended reduction of some of the sections of some parts, as they were obviously very understressed. However, this could not be agreed to, since it would have altered and spoiled the appearance of the finished machine.

Printing copies of the finished drawings would likely cost "the Heavens", so a local company with a drawing office was contacted and an arrangement was effected whereby their printing

equipment would be used, with printing paper obtained at a reduction from 6 shillings to 6 pence per print - providing that I did the actual printing! In all, 32 ten-yard rolls of 30-inch paper were used to obtain 3 sets of the prints.

Once the copies were made, they were despatched to Dr. Nicholls in Canada and it then appeared that my part in the project was completed.

But this was by no means the case! Early in 1970, my presence in Montreal was requested, to meet Mr. S. Hirota, chief designer for Kawasaki. We checked the drawings that Mr. Hirota had had prepared against those that I had done and clarified many points which had hitherto been unresolved. I was very much impressed by their grasp of the project and the rapidity with which our mutual inquiries were explained.


In the completion of this difficult and complicated task, invaluable assistance had been provided by Mr. John D. Boyd, Director of the Dundee Museum and Art Galleries, who worked miracles in finding information for me. Equally helpful was Mr. Walter Murray, Librarian of the Alloa Libraries, who tolerated my incessant chasing for books from other libraries all over the country. To these two gentlemen I am deeply grateful.

Writings about the history of the city and citizens of Dundee, Scotland, provide very limited detail on the history of the firm of Kinmonds, Hutton and Steel. It is known that Kinmond, who owned bleach-fields outside Dundee, was the financial backer, while Hutton and Steel were the engineers. The firm was organized in the late 1700's and went out of business about 1900-05. Their main activity was in the production of textile machinery for the flax and jute industry and several notable improvements are known to have been made by them.

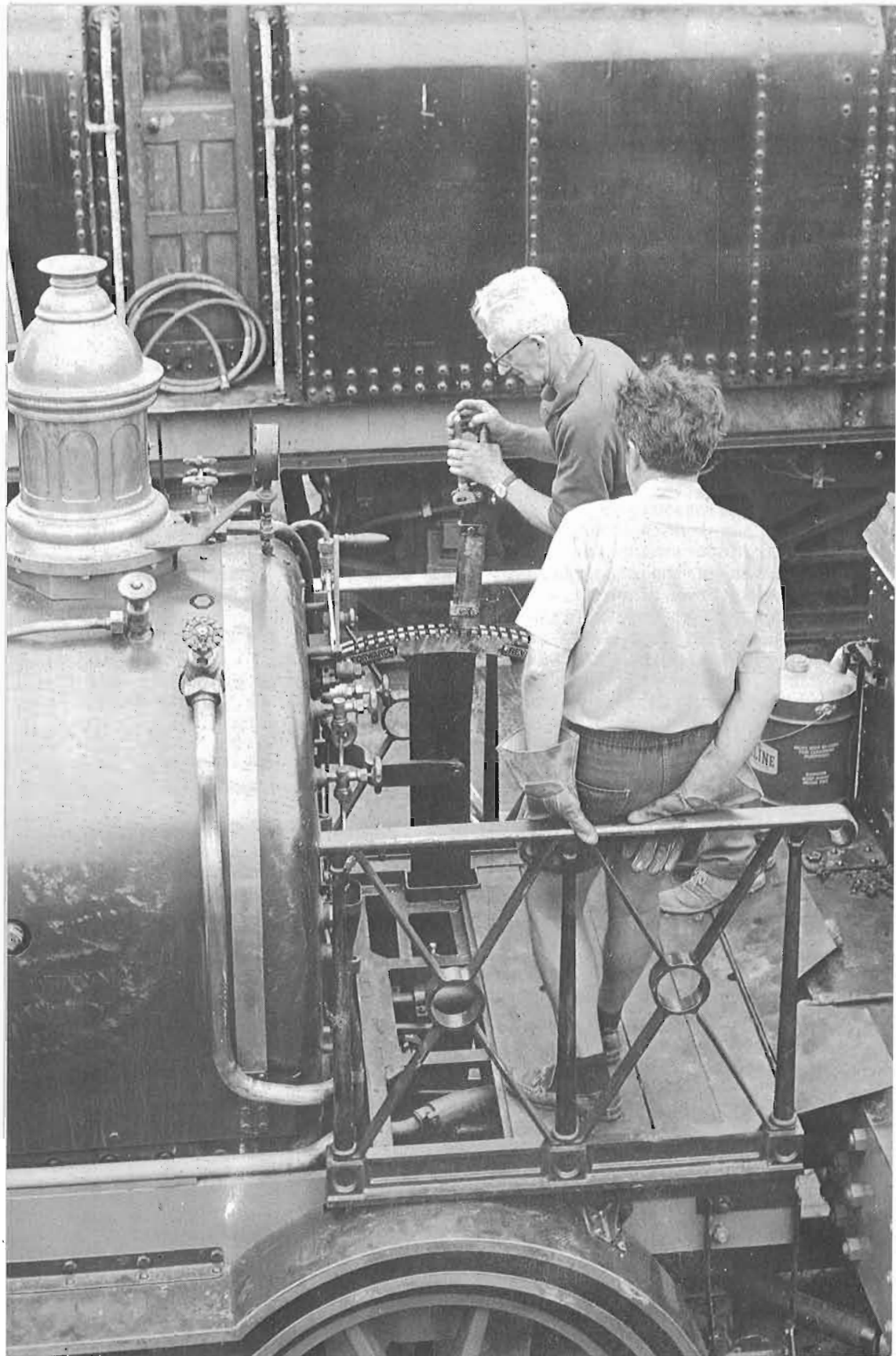
When railways were being built all around in Scotland, Kinmonds, Hutton and Steel went into the business of steam locomotive building and are known to have made seven locomotives for the Glasgow, Paisley, Kilmarnock and Ayr Railway, two or three for the Dundee and Arbroath Railway, three for the Montreal and Lachine Rail Road and one is recorded as being thereafter offered for sale. There is the possibility that others were made.

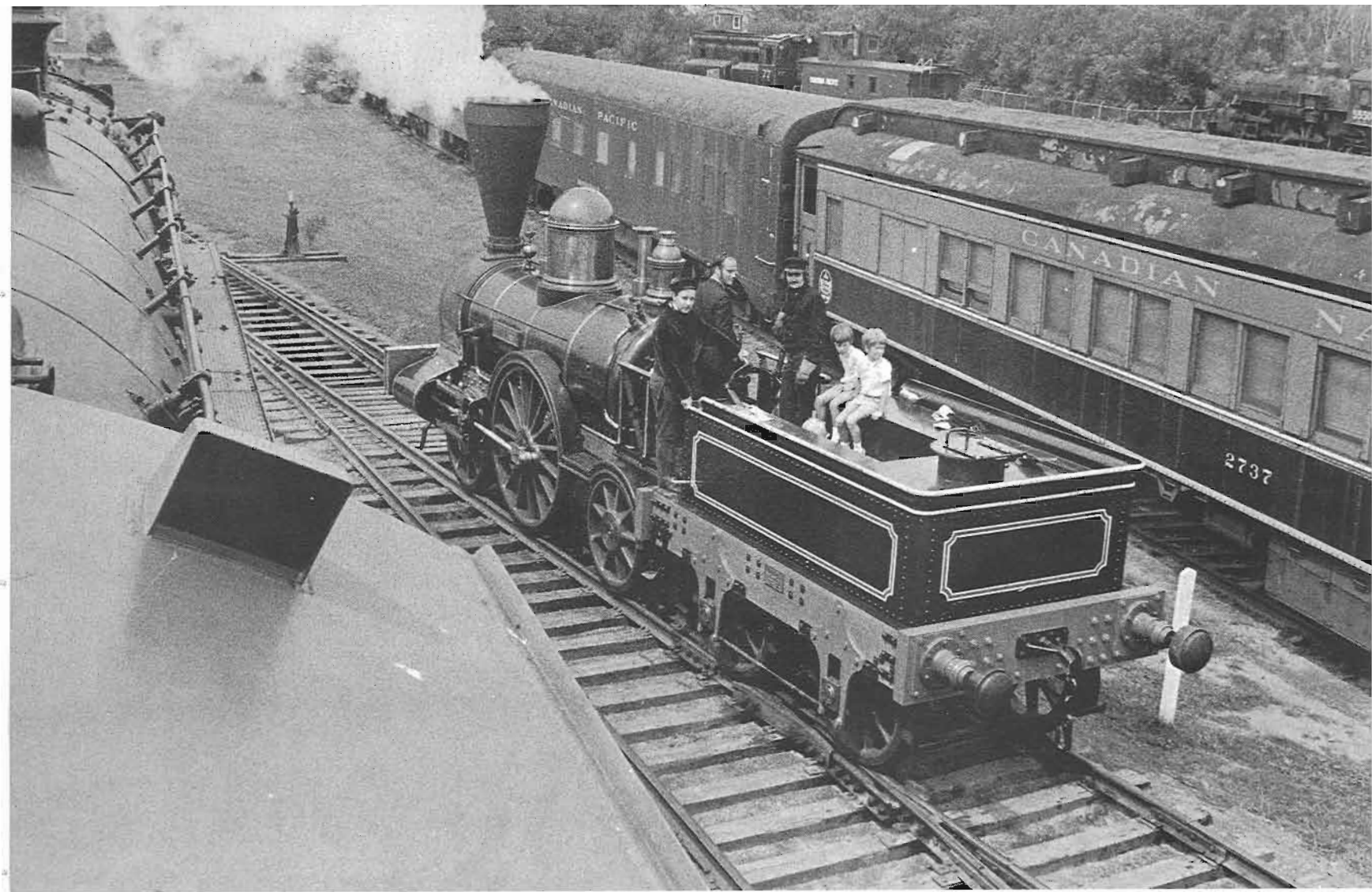
After all the labour of perfecting the design of the JOHN MOLSON of 1971; after the mountains of correspondence; after the exciting and unexpected trip to Canada to meet Mr. Hirota from distant Japan; the final highlight of this undertaking was, for me,

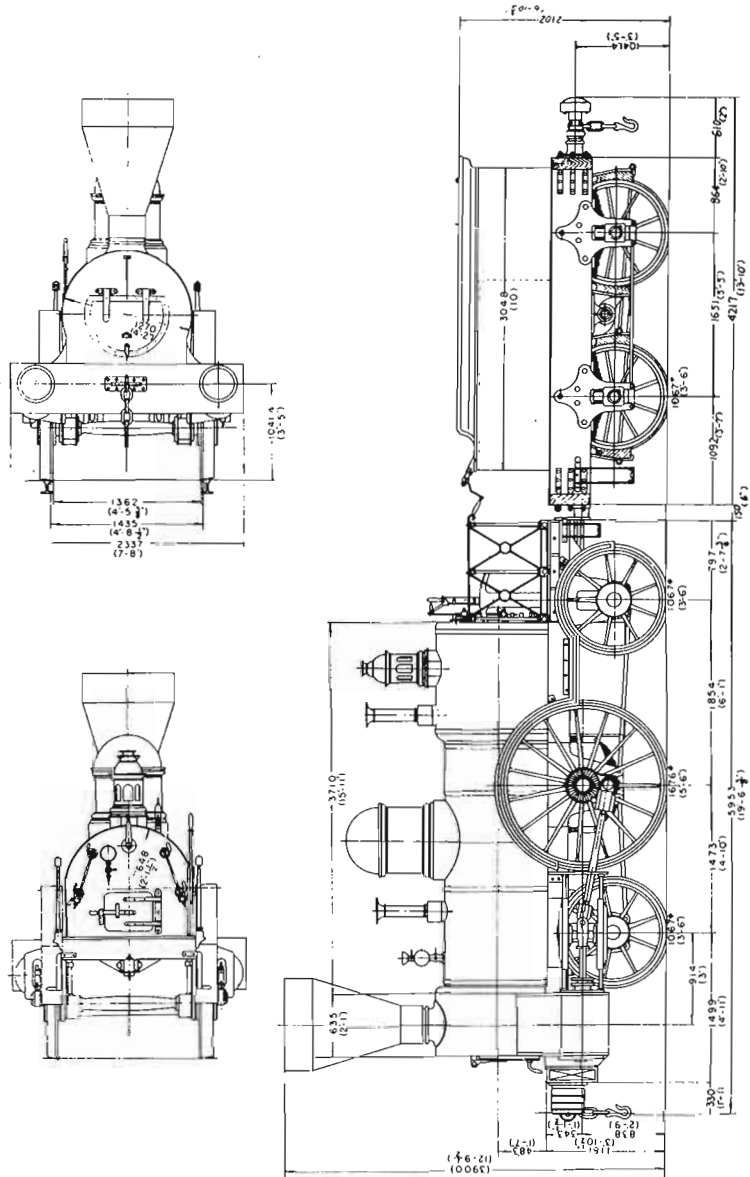


 ON THE FOOTPLATE OF THE JOHN MOLSON OF 1971, MR. GORDON SMALL TRIES THE reversing lever. Photo Tom Montgomery.

At the celebrations on August 14, 1971, Mr. Stephen T. Molson is accompanied by Masters Bryan and Thomas McFarlane on a trip with the 1848 replica. Photo Robert Nadon-LA PRESSE.







the receiving of an invitation from the Canadian Railroad Historical Association through its President, Dr. Robert Nicholls, to attend the Members' Day Celebration at the Canadian Railway Museum, to see the locomotive being landed and to drive her on her first run under steam on Canadian soil. Having designed it, seen it in finished form and driven it, I am most impressed by the quality of workmanship that the Japanese builders have put into the engine and I have a profound feeling of satisfaction that the work which I had the privilege of beginning has been completed in the best possible manner.

One can never tell what may result from a letter which the postman brings to one's door, especially when it is postmarked "Canadian Railroad Historical Association, Montreal, Canada".

THE TENTH ANNIVERSARY CELEBRATION

F.F.Angus.

SATURDAY, AUGUST 14, 1971, WAS
the day of the celebration
of the Tenth Anniversary of
the Canadian Railway Museum.

The occasion was doubly important, for not only was the Museum beginning its second decade, but this day also saw the first official operation of a steam locomotive at the Museum. The locomotive was, of course, the full-size replica of the JOHN MOLSON and by a happy coincidence, it was ready for service just in time for the Museum's Tenth Anniversary.

A special train consisting of two CP RAIL DAYLINER rail diesel cars - numbers 9116 and 9114 - left Montreal's Windsor Station and, carrying more than eighty guests, pulled up to the platform of Barrington Station at the Canadian Railway Museum - Musée Ferroviaire Canadien. At the same time, other members and friends arrived by alternate means of transportation so that, as noon hour approached, about 150 persons were assembled. Prominent among the guests were Senator Hartland de M. Molson, other members of the Molson family, Mr. Adolph Monsaroff, President of DOMTAR Limited and representatives of the Mitsui and Kawasaki (Canada) Companies. Also in attendance was Mr. W. Gordon Small of Alloa, Scotland, who had drawn the original designs for the replica.

Everyone assembled near the Hays Memorial Archives/Library Building and the President of the Canadian Railroad Historical Association, Dr. R.V.V. Nicholls, opened the festivities with a speech of welcome, followed by a recitation of the history of the Canadian Railway Museum and the JOHN MOLSON project.

Then came the long-awaited moment. Dr. Nicholls gave the signal and the JOHN MOLSON - operated by Messrs. Ian Webb and Peter Layland, suitably dressed in mid-nineteenth century railwaymen's costumes - started forward and slowly came up to the platform of the Hays Memorial Building. A few moments later, Senator Molson himself mounted to the footplate and took the "regulator" for the round-trip down the line to Barrington Station. During the remainder of the after-



↑ Dr. Nicholls introduces the distinguished guests to the members of the Association on Members' Day, August 14, 1971. Photo S.S. Worthen.



noon, the JOHN MOLSON made several additional trips and hundreds of photographs were taken by those present.

The guests then proceeded to a specially arranged area near Barrington Station and there partook - not of the traditional cold collation - but of a steaming chicken barbeque. Later, the participants were treated to a ride in ex-Canadian Pacific caboose number 435288, hauled by ex-Canadian National diesel electric locomotive number 77. After this exciting experience, the remainder of the afternoon was free, so that the members and friends could inspect the many exhibits at the Museum.

All too soon, the "all aboard" call was sounded and the guests and members once more boarded the "Museum Special" for the return trip to Montreal. At 4.30 p.m., "Extra 9116 west" left Barrington Station for the return trip. Soon all the guests, members and friends had departed and the JOHN MOLSON was thereafter put safely away and the Tenth Anniversary celebrations were over.

The first ten years in the history of our Museum are complete and we now look forward with pleasant anticipation to the events of the next decade.

CHARLES VIAU



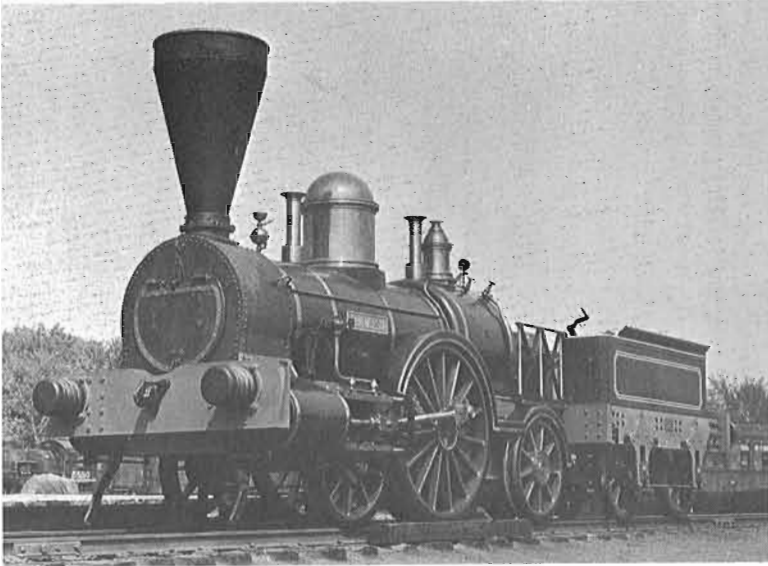
One of the victims of a tragic highway accident which occurred in Spain on September 17, 1971, was Charles Viau, Vice-President of the Canadian Railroad Historical Association. Mr. Viau was in his sixty-ninth year.

The duty of recording the passing from this life of a true friend and valued associate is ever a difficult and sorrowful duty, more particularly for those who were proud to number such a person among their most respected friends. It is the more difficult when death claims the victim so unexpectedly, so swiftly - and so needlessly.

Mr. Viau took part in the Association as a member and as Vice-President, Secretary and Director for more than three decades. Of a quiet, happy and gentle disposition, he was distinguished particularly for his enthusiasm, his generosity - his financial benefactions to the Association constitute an impressive record - and his equanimity. His deportment could be perfectly described as that of a diplomat. During his close involvement with the Association as a Director, he invariably demonstrated a rare ability to remain aloof from divisiveness and contention.

The Officers, Directors and Members of the Association express their sincere condolences to his wife - who was seriously injured in the same accident - and to his family. These will be added to the many expressions of sympathy and understanding from the vast multitude of his friends.

"Heureux les doux, car ils recevront la terre en héritage....."



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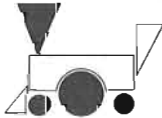
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