

SUB-REPORT re SOREL SHIP YARD No. 1.

BY MESSRS. W. S. JACKSON AND T. H. SCHWITZER.

To the Public Service Commission:

GENTLEMEN,—In March last you requested the undersigned to undertake an investigation of affairs in the Mechanical and Practical Departments of the Government Ship Yard at Sorel, P.Q.

Accordingly we proceeded to Sorel, and from the 11th March to the 5th April, were continuously engaged in examination of all parts of the Ship Yard coming within that scope, and of all officials and employees connected therewith.

As a result, we have the honour to present a report, arranged under various headings indicative of the subject or branch of work under review; and submit therewith appendices referred to in the report.

* We also present for reference plans and blue prints of the whole Ship Yard, parts thereof, and various craft under construction therein. The report follows:—

GENERAL DESCRIPTION.

The yard is under the Marine and Fisheries Department, and all instructions regarding the work to be done at the yard are issued by this department, and are issued by the Minister or Deputy Minister. The yard is under the supervision of Mr. Papineau, who has the title of Director of the yard. Mr. Papineau has under him and reporting direct to him the Assistant Director, Accountant, Cost Department, Paymaster, Timekeeper and Storekeeper. The Assistant Director, Mr. Terreault, has under him all the different shops, ship yard and drafting office. Mr. Papineau has held his present position for about two years, previous to which time he was for about one year Assistant Director under Mr. Desbarats, coming to this position from the Department of Public Works, where he was employed as a civil engineer.

The yard shows a remarkable lack of proper control, discipline and proper regulation throughout all departments. Wherever you go you can find men in bunches of six to twenty loafing around, comfortably seated around a fire, smoking and some of them even asleep. This loafing is very apparent, yet no action whatsoever seems to have been taken to stop it. A certain amount of this can be attributed to the fact that the yard is overstocked with men, and it must be hard at times for a foreman to find work for all the men under him. Six and seven men are seen doing the work of two or three. One foreman on being asked why he used so many men on a certain work remarked, that he had "to keep them busy, and if they were not doing that there would be nothing else for them to do." The Assistant Director or the foremen have very little or no authority over their men. They cannot discharge a man, being only able to report him to the Director. The Director reserves for himself the right of employing or discharging all men; he does this from purely personal reasons, being afraid of the political side of the affair, as his evidence will show. The fact of his doing this takes away from the heads of departments and foremen the proper authority they should have over the men to control them.

* Plans not printed.

The yard has practically no general supervision as the Director and Assistant Director spend nearly all their time in their offices. We have never seen either the Director or Assistant Director out in the yard supervising the work during the time we were there. We can see the effect of this lack of proper supervision throughout the whole yard.

The yard is located on the southwest shore of the Richelieu River, and extends to the River St. Lawrence. The yard is located on part government property and part private property, an annual rental of \$1,200 being paid for the private property. No taxes or insurance are paid on any of the property. The property owned by the government comprises an area of about 80 acres, but only about 14.5 acres of this property is at present in use. The property owned by the McCarthy estate comprises an area of about 9.7 acres, making a total area of 24.2 in the present yard.

The buildings are mostly of wood construction, built on piles on account of the swampy nature of the ground. The only brick buildings being the old power house, which is now used for boilers and the upper floors for pattern storage, and the new power house which is of comparatively new construction. Some of the buildings are in very poor condition, and all are exceptionally dirty and poorly kept. The list of buildings, their use and condition of same is shown in Appendix "A." There are a large number of small buildings, shanties, watchman's house, &c., scattered all over the yard. These should all be torn down and scrapped, as they are simply loafing places for the men. These houses all have nice comfortable seats and lounging places, with a nice warm fire nearly always burning. The whole yard wants a general cleaning up and overhauling, scrapping a lot of useless material, &c., which is lying all over the place. All the buildings should be gone through and a thorough cleaning given to them all, using whitewash without sparing it, as it is cheap and badly needed. The shops all have heaps of scrap of all kinds lying all around inside of them, which should all be cleaned out and make the buildings present a neat and tidy appearance. They have enough labourers in the yard to do this work without in any way interfering with their present operations.

The yard is equipped with a very good industrial railway system which is shown on the yard plan marked Appendix "B."* The railway is only used in the summer time being allowed to remain covered with the snow all winter; all the heavy moving being done with horses and sleighs. The principal lines of this railway could be easily kept clear of snow during the winter months, and all heavy material carried on this railway, thus doing away with a great deal of teaming work. This railway should have extensions running to all wharves for the convenience of handling material. Should the yard be retained as a repair yard only, the present location is suitable and would be satisfactory for this work. Should the yard carry both construction and repair work we consider it would be advisable to move the yard towards the St. Lawrence river, thus giving better facilities for launching, and bringing the stores closer to the construction, thereby saving a great deal of time and labour. The present buildings could be moved to new locations doing away with the rented property altogether. The outer end which at present is low lying land and covered with water during high water period could easily be reclaimed and made of service to the yard.

The yard at the present time is practically accessible to everybody, and has no means of keeping strangers out, strangers wandering at will throughout the yard and engaging in conversation with the men. The yard should be completely enclosed with a fence as shown on plan marked Appendix "B"*—thus providing only one entrance to the yard. The office should be so placed that it should not be necessary for anybody having business in the office to enter the yard.

The offices are very poor and not in keeping with a government yard at all. They are too small, low ceilings, badly lighted and ventilated, in fact some of them are so

* Not printed.

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crowded that the air is impure. The toilet accommodations for the number of office staff is sadly inadequate, badly placed and not kept properly cleaned as they should be. We would recommend that new offices be built at the main entrance gate as mentioned hereinbefore. No strangers should be admitted to the yard without a pass signed by the Director.

The fleet during the winter months could be enclosed with portable fences similar to snow fences used by the railway companies; these fences could be locked together during the winter and stored away during the summer months.

The boats are all launched in the Richelieu river, the river being about 500 feet wide and 25 feet deep where the largest boats are launched. The longest boat ever built at the yard is 270 feet. The longest boat they could launch at the yard with present facilities is about 300 feet long. Boats of greater length could hardly be safely launched with present facilities and difficulties in the way. A basin could be very easily dredged opposite the ship yard so that longer boats could be built and safely launched. The present condition will permit of the building of two large boats, two small tugs and three or four scows at the same time.

The yard is equipped with two so-called marine railways, but these are not really marine railways at all, being ordinary hauling-out ways. These ways are used to haul boats out for repairs to hulls, propellers, &c. The new ways will accommodate a boat of about 1,000 tons displacement, while the old ways are used for small boats such as tugs and scows, &c.

The organization of the yard is shown on organization chart marked Appendix "C." The organization is well laid out, if properly carried out, but it is not in this case. The accountant does not know what the storekeeper is doing, nor does the Assistant Director know half the time what the foremen are doing, these men very often going to and getting their instructions from the Director which does not tend to help good management in any way.

The whole ship yard wants to be completely overhauled, and something drastic must be done to bring the yard into good shape. The Director should be a ship-builder and his assistant and foremen must be men of calibre and of good modern practices. The men must be handled in such a way as to let them see that their superiors know what is required of them, and if they won't fall in line, pick up and stir themselves, the foreman must have power to discharge them. The yard will never be up to date or capable of any good economical work until about three-quarters of the present employees are discharged and new blood put in.

A proper set of rules and regulations should be drawn up and posted throughout the yard. The men should be given to understand that these rules and regulations would be carried out to the letter. At present the yard has no printed rules and regulations, everything being done verbally.

The Director must himself appear frequently in the early morning and his assistant every morning to see the men started. He and the foremen should consider it part of their duty to be at different parts of the yard every starting and stopping time, and make the men stay at their work until the whistle blows.

The Director, Assistant Director, Accountant, Cost Clerk, Timekeeper, Paymaster and all foremen were put through a cross-examination as to the methods of working, &c., of the various departments. These questions with their respective answers will be found in Appendix "D."

PURCHASING OF GOODS.

All goods or materials at the present time are purchased through the general purchasing agent at Ottawa. Any material for stock is ordered by the storekeeper who just uses his own judgment when new stock is required, having no maximum or minimum amount placed on any thing in stock. The storekeeper makes out a requisition on the Director, who in turn makes out a requisition on the general purchasing

agent at Ottawa. The general purchasing agent gets prices on goods, and orders them as he thinks best. This procedure takes on an average a month's time before the goods are ordered. The general purchasing agent sends a copy of his requisition to the yard on which is the firm from which goods are ordered with the price to be paid for these goods.

All goods bought on samples should be properly checked by sample by a competent man. All goods ordered from Ottawa by sample should have the sample returned by Ottawa to the yard. All goods received at the yard and not according to sample should be returned immediately. This has to be done only a few times before the shipper of the goods becomes aware that goods have to be according to sample. At the present time this is not done, as there is generally some compromise made and the yard retains the goods sent although in some cases they are of a much inferior quality. The invoices and goods are all checked from this requisition. All goods are first put into stock and entered on stock books and are withdrawn from stock on requisition forms from the foremen or heads of departments. We consider that a great deal of time and money could be saved if all standard material was purchased on yearly contracts. These contracts could all be arranged by the general purchasing agent and copies of all these could be sent to the yard. The Director could then order direct from manufacturer, and thus save a lot of time and unnecessary work at Ottawa and the yard. Copies of all orders for material could be sent to Ottawa as a check on the amount of material ordered.

In making basis price contracts for supplying steel plates and shapes for construction purposes, a rolling margin of $2\frac{1}{2}$ per cent over and $2\frac{1}{2}$ per cent under calculated weights ought to be insisted upon, and every invoice calculated and rectified before being passed for payment.

A list of extras for steel material, tapered plates and plates under a certain width, also angles under a certain size should be agreed upon in the contract, and all extras carefully noted. All such material bought should be stamped L.R., and test certificates supplied and attached to the invoices.

All castings and forgings contracted for by weight should be carefully checked by the drawing office staff and any extra weight over the drawing calculated weights should be deducted from the invoices before being passed for payment. All structural steel castings should be tested according to Lloyds Rules and Regulations and test certificates supplied with each casting.

The stock of goods carried at the present time is far in excess of that required; this is partly due to the length of time it takes to get goods by the present system.

EMPLOYMENT.

The method at present in vogue of employing and discharging men is not such as would be used in any well organized yard. The Director does all this himself, for the reason that nearly all men engaged in the yard come with letters addressed to the Director. This should be done away with, and nobody should be taken on unless absolutely needed. When any new men are required in the yard the Director should not have to deal with this at all, it should be left in the hands of a reliable man who should be allowed to hire the best qualified man for the position, consulting with the foreman as to the man's qualifications. This man should keep a record of all men engaged, all applicants for work with their qualifications, and report to the Director or Assistant Director whenever a new man is engaged, stating for which department the man was engaged. The foreman should be the judge as to whether a new man is required in his department, and should notify the employment clerk when he needs a new man, stating what qualifications he requires in this man. The employment clerk could then look over his list of applicants and pick out from this list the man most suitable for the position, and refer these to the foreman for his approval. The

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foreman should have the authority to discharge what men he sees fit and then make him in every way responsible for the output of his department. When any man is discharged by a foreman the foreman should notify the employment clerk giving reasons for discharging the man, the employment clerk keeping records of all men discharged. All foremen and heads of departments should be engaged or discharged by the Director without any outside interference, leaving it to his judgment as to the best man for the position. The employment clerk should make a weekly return to the Director showing the number of men employed in each department of the yard.

The men are paid time and a half for over-time work. The amount of over-time work at the yard is comparatively small. The yard has two days for which they receive pay. They are allowed half day on Victoria Day, half day on Dominion Day, and the whole day on Labour Day. They have made a compromise with the Director and work all Victoria Day and take all of Dominion Day off. The rest of the holidays for the yard is without pay. The following is a list of holidays for the yard force:—

New Year's Day.—Closed for about 7 or 8 days. The Director posting a notice as to the length of time yard is closed.

Epiphany.—Closed all day.

Ash Wednesday.—Closed in the morning.

Good Friday.—Closed in the morning.

Ascension Day.—Closed all day.

Victoria Day.—Work all day.

Dominion Day.—Closed all day. Paid.

Labour Day.—Closed all day. Paid.

All Saints' Day.—Closed all day.

Christmas Day.—Closed all day.

In July or August each year the men without any permission take about three days for the purpose of fishing or going to the races. All the yard, except office, is closed down during these days. It has become an annual practice for the men to do so. This practice should be done away with at once.

The working hours of the yard are from 7 a.m. to 6 p.m., from March 1st to October 1st, and from 7 a.m. to 5 p.m., from October 1st to March 1st, one hour being curtailed on account of darkness. The hours for outdoor workers should be further curtailed during the winter months. The yard is allowed one hour and five minutes for lunch.

The office staff get paid for all holidays, and are allowed about ten days with pay during the summer months. The office hours are from 8.30 a.m. to 5 p.m. the whole year around. The office staff is allowed one and a half hours for lunch. The following is a list of holidays for the office staff:—

New Year's Day.—Closed for 2½ days.

Epiphany.—Closed all day.

Ash Wednesday.—Closed in morning.

Good Friday.—Closed in morning.

Ascension Day.—Closed all day.

Victoria Day.—Work all day.

Dominion Day.—Closed all day.

Labour Day.—Closed all day.

All Saints' Day.—Closed all day.

Christmas Day.—Closed all day.

The office staff during the summer months get every alternate Saturday off. The office staff and foremen's wages are such as to cover over-time and holidays.

STOREKEEPER.

This department is divided up and scattered all over the yard. All small stores are located in same building as the office, while the larger stores are located in various other buildings. The rivets, nails, &c., are stored in a separate building which is about as far away from the construction as it could well be. The wire and manilla ropes are in another separate building; castings are lying pretty much all over the yard and the storekeeper has no way of keeping proper track of these. The stores should be consolidated into one large building and a good fence built around all castings so that it would be impossible to get any stores without the storekeeper's knowledge. All goods are received and checked by the storekeeper and entered with prices on the stock books as received. All goods bought for the yard are first charged to stock and then charged against the job. All goods are given out of the stores on requisitions from the foremen or other heads of departments who state on requisition the job number for which the material is required. The requisitions are entered on the stock books on the debit side, the price of the material is marked on this requisition by the storekeeper and then forwarded to the cost department where it is charged against the job. This requisition is only made in single copies, there being no carbon copies made by any department. This requisition should be made with carbon copy so that the storekeeper could have a copy for his own file for reference, the original being sent to the cost department as before.

The storekeeper has 11 men under him to handle the stores, keep the stock books and check all goods as received. This seems a very large staff for the work to be done. The men should be assigned to certain definite parts of the storehouse, that is they should have one man look after all castings, plates, angles, &c., another man to look after all pipe fittings, valves, &c., and these men should check all these goods when coming into stock and should give out all stores from their respective branches, thus making these men in every way responsible for the stock under their charge. By the present method of every man in the store department having access and the giving out of any class of goods makes it so that no one man can be held responsible for goods. All goods received are checked from copy of requisition sent from Ottawa both as to prices and material. The head storekeeper signs and passes all invoices as to goods being received, the price being right, and the extensions correct. The head storekeeper should only sign invoices as to goods being received and should not check as to price and extensions; this is the accountant's work. The invoices are sent from the store department to the accountant who again certifies as to the amount being correct, &c., and then passes the invoice on to the Director who certifies the invoice for payment, the invoice is then sent to Ottawa where a cheque is issued covering the invoice. This entails a duplication of work, and should not be necessary at all. The storekeeper can sign for goods received, the accountant can sign for prices and extensions and send the invoice direct to Ottawa; the accountant making a bi-monthly statement of all invoices passed and submitting this to the Director for his information. The present value of the stock is an unknown quantity as no records or inventory has been taken for three years, an inventory is being taken at the present time. This inventory should be checked against their stock books to see how they tally. They carry on an average, stock for about six months ahead which is quite unnecessary. All goods bought on sample are checked by the store department, they generally send out the sample from the yard and then check goods when they come in from what they have at present in stock. When goods are not as sample the Director takes the matter up with Ottawa and the disposition of the goods is settled by Ottawa.

SCRAP.

All scrap material is sorted out as scrapped and is stored in piles at far end of yard according to the kind of material. All brass scrap is kept under lock and key,

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and is overhauled by the stores department before selling. There are no records kept of what is scrapped, the material being scrapped by the foreman in each department. The purchasing agent at Ottawa writes to yard about once a year asking them for approximate amount of scrap on hand; on receiving this information the department at Ottawa calls for tenders for scrap material and gives the contract to the highest bidder. The yard is notified by Ottawa to this effect. The checker of goods of stores department looks after all the scrap and looks after the weighing and loading of same and is entirely responsible for this scrap. There is no check on this - an whatsoever as to weight or material given out as scrap, This should all be checked up by an assistant.

TIMEKEEPING.

The men's time is kept by a timekeeper and his assistant. The men punch time clocks of the card type, a man takes a card out of a box hung on wall, inserts the card in the clock and returns the card to another box on the opposite side of the clock. Each clock is looked after by a different man who gets 20 cents per day extra for this work, and who sees that the boxes are locked and unlocked at the proper time. Each clock box is unlocked about fifteen minutes before starting time and is supposed to be locked sharp at 7 a.m. and 1 p.m., and the clocks are not supposed to be opened again till 9.30 a.m. and 3 p.m., when any man coming in late is allowed to punch and loses a quarter day. That this rule is not carried out is shown by looking over the time cards which show many men punching at different times, some punching as late as 7.50 a.m. without being docked, getting a full day's pay. The punch keeper of each clock submits a report, scribbled on any old piece of paper, every morning and afternoon to the timekeeper, of the name of the men with their clock number, who are absent. The punch keeper gets this record by simply looking over the cards that are remaining in the incoming box. The timekeeper looks over these reports and never check's the men's time from the clock cards. The record of men's time shown on cards is simply ignored, so that at present the time clocks are absolutely useless and may just as well be out of use altogether. The timekeeping system throughout is very lax. The time cards are only returned to the timekeeper once a fortnight, but the men's time is all made up before the time cards arrive. The keys for time clocks are supposed to be returned to a board for that purpose in timekeeper's office at 7 a.m. and 1 p.m. every day and also before leaving at night. The keys we find are not returned regularly to this board and nobody appears to keep any check on them. We observed this for several days, and hardly ever found a key hung on the board. We have left the office at 7 p.m. and there was not a single key in the place, the men evidently carrying them home in their pockets. The clocks are apparently never looked after properly, as we found cards that the figures were so indistinct on that it would require a magnifying glass to make them out. They have a man in the blacksmith shop who is supposed to go around each day and examine the time clocks and see that they are all in order and are punching properly. He gets half day extra per week for this work, and is supposed to do it after hours. How well he attends to his work and how observant the timekeeper must be is shown by the fact that for twelve days one clock punched the same time in and out both morning and evening, which would indicate that the clock was stopped or the punch figures had got stuck; this went on for twelve days before discovered. This would indicate an utter lack of proper supervision over the time clocks and time keeping generally. Each clock has two hundred numbers on them and are located and looked after as shown by list marked Appendix "E." The clocks have too many numbers on them as it takes the men fully five minutes to all punch the clock, and on account of this the whistle blows at 11.45 a.m. so as to allow the men the full hour for dinner. The clocks are fairly well distributed considering the number of men on each clock, but some of the men have to walk quite a

distance to punch the clock, which naturally causes them to knock off work and be near the clock in time to punch it if they are not closely watched, which is the case here. Where the men working outside have to go inside to punch a clock the shop door is locked and is not opened before the whistle blows, but the crowd is all lined up outside waiting to get in to punch five minutes before the whistle blows; to do this they all knock off work about fifteen minutes before quitting time, and it takes them at least that time to get started to work, thus each man in the whole yard loses on an average of an hour each day which you can readily see is a big item of expense. The average pay of the men in the yard is about \$1.75 per day, and taking on an average 800 men working each day it means a loss of \$140 per day, or a loss of about \$41,300 per year to the government. Besides this lost time there is a great deal of time lost by the men loafing around, which we will not attempt to estimate although we consider that the total time lost each year in the yard would not be covered by double the above amount.

The office staff do not punch the time clock, but sign a book once a day when they come in the morning. These books are supposed to be sent to the Director's office each day and signed by him. Some of the men come in late almost every morning, but apparently no attention or action is taken.

The present system of time keeping we consider could be improved on in many ways. When the clocks are locked at 7 a.m. as now, a man coming in a few minutes after 7 will loaf around till 9.30 when he is allowed to punch. While thus loafing around he is talking to the other workmen and keeping them from their work. We consider that the clocks should be locked at 7 a.m. sharp and opened again at 7.15 a.m., allowing all the men who are late to punch, these men losing one hour's time. At 7.15 a.m., after all the men have punched, the clocks should be locked and not opened again till 12 noon when the men punch out. The clocks should be locked at 1 p.m. sharp and not opened again till 6 p.m. when the men punch out at night. Each clock clerk should have a spare card on which he should make a daily punch and send same to timekeeper for his information as to how the clocks are registering. All the men's time should be taken from the time cards and not from slips sent in by clock clerk. This practice of the clerk sending a list of men absent to the time clerk should be discontinued at once, thus making the timekeeper take men's time from cards. The clocks should be inspected periodically by a qualified watchmaker as to correctness of time and regulation. There is another system of time clocks which we consider more satisfactory in every respect and is known as the "Day" time clock. This clock will give a daily or a weekly record as desired, the daily being preferable as the timekeeper gets records each day of the men's time. This clock has all men's time punching on any one clock punched on one sheet thus doing away with a card to each man which takes considerable more time to check up. Any man coming in after hours is clearly shown by the ink on tape being of a different colour and easily distinguished. The clocks could be of 100 numbers each and distributed over a wider area, some of them could be portable to suit conditions such as working on board the boats, &c. These clocks if desired could be electrically controlled as to time from a master clock in the office building. These clocks are quicker in operation than the present system and would not require the same length of time for the men to punch once they get used to them. At present it takes on an average from four to five minutes to punch the time, while the time required for these other clocks would be about half this. The present system of clocks, although not of the best, could be used to good advantage provided every one connected with them attended to their proper duties.

The foremen in the different departments do not punch the time clock or sign a book, the foremen are supposed to notify the timekeeper if they are absent. The foremen do not lose time when absent, and there is really no check whatsoever on their time. We consider it would be a good plan to have a slip board for Director, offi-

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cials, and foremen, placed close to Director's office, this board to be shifted as they come in and go out, and would show at once to Director whether all the foremen were in or not. A slate would form part of the board, and they would write on this slate where they were working so that the Director would see at a glance where every man is. The watchmen do not punch the regular clocks. The night watchman has a key clock which he punches as he goes around the yard once every hour. The day watchmen are supposed to report to the night watchman, no other check being kept on their time; the day watchmen should all punch the time clocks. They have two stablemen who are supposed to come in at 5 a.m. to feed the horses, harness them and have them ready for work at 7 a.m. These men perform the same duties at noon and at night, but there is absolutely no check kept of their time, and judging from the condition of the stables they don't spend any too much time there.

COST KEEPING.

This department is supposed to keep complete records of all new construction and repair work. The cost is divided into two heads called direct and indirect cost. The direct cost is supposed to include all material and men's time who are working on each job. The indirect cost is equivalent to an overhead charge and includes heat, power, light, rent, and the salaries of all men who are not distributed on jobs, such as watchmen, foremen, firemen, office staff, &c. The men's time is distributed by the foreman in each department, and a list sent to the cost department each day of where the men are working. This system is very indefinite. Each man should fill out a time sheet each day showing exactly how many hours he spent on each job. These would be better for the cost clerk, besides the Director could see from these occasionally how long any one man had taken in doing a certain piece of work, and be able to tell whether a man had taken too long on the job, thus checking up excessive costs and tracing them to where they belong. Each new construction is divided into different headings and a construction number is issued for the whole work, and then a job number is issued to each separate heading. These numbers are at present issued by the Assistant Director; this is really a clerk's work. They do not follow out the same heading on each construction which is somewhat confusing, and even then things are pretty well mixed up. They could easily divide all construction under certain definite headings such as for hull construction you could have plating, caulking, rivetting and drilling; for painting work you could have hull outside, hull inside, cabinet work and joiner work; for carpenter work you could have erecting, decks, launchings, spars and deck house, &c. The outfit should be arranged alphabetically and the cost of each item kept separate, &c. If this was done for all construction work any clerk could issue all order numbers as they would simply run concurrently. This would also give a better idea to the Director of the cost of each operation and costs could be checked up much more readily than at present. All material charged against the construction is taken from the requisitions sent up by the storekeeper, and prices are always charged as shown on these requisitions, no check being made of these prices whatsoever. The indirect charge for light is divided on the basis of the number of lights in each department, for power it is divided on the basis of the motive power in each department, foremen and clerks are charged direct against their departments; for office staff, watchmen, &c., a percentage is struck, and this is added to each department. The ratio of the direct to indirect charges is excessive, but this is doubtless partly due to the high cost of construction. The indirect charges could be cut down considerably under proper management.

ACCOUNTANT'S DEPARTMENT.

This department looks after all vouchers, cheques, petty cash, &c. The accountant has no power regarding the issuing of cheques except for petty cash, all cheques being

issued from Ottawa. The timekeeper makes up the pay roll each fortnight and sends a copy to the accountant, a copy to the paymaster and the original goes to Ottawa. The accountant wires Ottawa the amount of the pay roll as soon as it is made up. Ottawa wires a credit for this amount in favour of the accountant on the bank at Sorel. The accountant in turn makes out a cheque in favour of the paymaster covering this amount and the accountant checks up the paymaster to see that this whole amount has been paid in wages. All invoices are sent to the accountant for his approval regarding prices and extensions being correct, and he forwards them through the Director to Ottawa. Ottawa issues a cheque covering this invoice and notifies the accountant by means of a voucher when the bill was paid and the number of the cheque. The accountant in turn notifies the storekeeper for his records. The accountant carries a petty cash account to the extent of about \$1,000, which is deposited in the bank jointly with the Director. This petty cash account is used for the purposes of small purchases which are required at once, a covering order being sent to Ottawa which in turn issues a cheque in favour of Accountant and Director to reimburse them for the amount spent on purchase. The petty cash account is also used for the paying off of any men who leave or are discharged before pay day, the Director and accountant issuing a joint cheque covering the man's pay. This is then included in the pay roll and the paymaster reimburses the petty cash account for this amount on pay day. This department submits a monthly report to Ottawa of all vouchers and petty cash account. There is more or less duplication of work on account of the present system of paying all accounts from Ottawa.

PAYMASTER.

This department pays all the men in the yard and on the fleet during summer and winter. The yard is paid fortnightly and is all paid by cheque. The fleet is paid once a month and paid in cash. The paymaster goes around the yard and pays the men in each department during working hours. The pay roll for the yard is made up by the yard timekeeper and is forwarded to the paymaster who checks it over for extensions being correct. The accountant issues a cheque in favour of the paymaster for the amount of the pay roll, he in turn issuing individual cheques in favour of each man on the pay roll. These cheques have to balance with the amount of pay roll and cheque issued by accountant. In case of over-pay it is carried over to the next pay and deducted from the man's time. In case of under-pay it is sometimes paid out of the petty cash account by the Director and accountant, the paymaster reimbursing them on next pay day, or it is sometimes carried over to next pay as before. This under-pay or over-pay can only occur through a mistake in the pay roll through a man being allowed too much time or not enough time. The paymaster asserts that this occurs very seldom, which we can quite understand from the very loose way of time keeping, as good care is taken to allow a man his full time whenever there is any room for doubt, his time never being checked from the time cards. The men in yard do not sign the pay roll, the paymaster receiving from the bank all the cheques endorsed by the men and uses this as a receipt. In case a man can't write the cheque is signed by a witness with the man's mark. The paymaster goes out once a month on the fleet paying all the men on fleet from Montreal to Crane Island; this practically takes about three days of his time. The pay roll for the fleet is made up by the Marine Department, which has an office at Sorel. The fleet is all paid in cash and each man signs for his money in the presence of the paymaster and the captain of the boat or dredge. In the case where a man cannot write the pay roll is signed by the paymaster and the captain signs as witness. The paymaster's time is all charged against the yard while we consider that a certain fraction of his time should be charged against the fleet. The present method of paying in the yard is bad on account of the time the men lose waiting around for the paymaster and also the disruption it causes to a department

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during the time the men are being paid. At present it takes the paymaster one-half day to pay all the men, which practically means that the men will lose on an average of half hour each on pay day. We consider that with two or three men paying as the men leave the yard at noon or night this could be all accomplished in at most fifteen minutes. The men could all be paid from the watchmen's house at the main entrance.

DRAWING OFFICE.

As now constituted, one man who styles himself Chief Draughtsman, has five or six men under him; this man designs new buildings, foundations for machines, &c. Another man is in charge of the hull department with one or two assistants, and another man is in charge of the engineering department, but none of them are properly constituted chiefs, having or taking no responsibility for their respective departments. There are altogether 12 men in the drawing office; they have no proper organized method of working or keeping records of work done.

In our opinion Mr. Bridges is well qualified to take control of the hull department with two or three men to assist him. A new man could be obtained to take charge of the engineering department with two or three assistants, and all the work right through the different shops, and he would also look after any building designs required, thus doing away with the present chief draughtsman and his staff. These two men to keep proper books of particulars showing dimensions of ships, sizes of engines, boilers and auxiliaries, weights of material, displacements, speed, horse-power of machinery, trial trip and stability, and all necessary details. These books to be set going at once and all back data of work collected and entered forthwith.

These two men must be able to take out weights of material, design hulls, engines and boilers, work out horse-power and estimate costs of all kinds of new construction, and be subservient to the Director alone who in turn would deal direct with the naval constructor in Ottawa. Seven good men all told, including blue print man, is an ample staff to handle the amount of work they have been doing in past years.

When called upon by the Director these men would make up detailed estimates of cost of any new construction proposed and make out designs and sketches for submitting to the naval constructor at Ottawa in competition with private yards. In the event of the decision being that the vessel was to be built at Sorel, then these men would see that they got returns of the cost from time to time during the progress of construction, and as the outfit was purchased would be able to keep the Director informed if the actual cost was keeping within the estimated limits; if not to investigate the reason why. The naval constructor would visit the yard at intervals and satisfy himself that things were going right as to management, cost and time taken to build, and be able to give personal advice where he thought necessary.

The drawing office is a miserable place and not fit for men to work in, being badly ventilated and low in the ceiling.

The design of drawing boards is not good, being far too small for ship yard work, and of too costly construction.

A vault ought to be introduced for keeping all valuable drawings, papers, books of particulars, &c., the key of this vault to be kept by the chief draughtsman and opened and locked by him personally morning and night. In the event of a fire occurring in the office at the present time simply means that every scrap of information they have would be lost which would cripple the place for years. This is very serious and ought to be looked into at once.

The space is hampered for stowing plans; we discovered a host of drawings in a wood box stowed away in the power house, the reason given being that they had no other place to stow them for fire protection.

MOULDING LOFT.

There are at present two moulding lofts, one should be discarded and the authority to run the loft taken out of the hands of the foreman carpenter who is not qualified at all for this work. The present loftsmen is all right, and must be directly under the charge of the hull draughtsman. Many improvements could be introduced into loft work. The present system of having about 12 men making templates for every frame in the boat is bad, in fact they make far too many templates; the work would be better done and cheaper if in many cases the plater went to the boat and made his own template. The wood used is too good and heavy, and is put together principally with screw nails (tacks are quite sufficient) and each man has a nice stool he carries about with him and sits while working; this is an unnecessary luxury. Instead of working battens on the floor with small 1½-inch nails, they ought to have spikes with round heads; it makes the work far easier on the men, as they don't require to be on their knees all the time, and the work would be done much quicker. A great amount of time and money saving inventions could be introduced into this department. The drawing office and mould loft are the backbone of a ship yard and these places want to be thoroughly re-organized and put on good sound working lines. They should be placed as close together as possible, as the mould loft man must consult very frequently with the chief draughtsman as to spacing of rivets, methods of doing work, explaining drawings, &c. At present spacing of rivets in new construction is altogether wrong, in many cases twice as many rivets being put in as are necessary, in other cases too few rivets are used consistent with strength. Lloyds, British Corporation and Great Lakes Rules for shipbuilding, a copy of each together with their rivetting tables ought to be kept in the drawing office and mould loft, and the tables displayed in conspicuous places and available to every one. A good Chief Draughtsman and a good Loftsmen are a "sine qua non" to a well-organized ship yard.

This will materially help the progress of the yard as a shipbuilding centre and make them capable of competing with private yards, as there is no reason why vessels should not be built as cheaply at Sorel as anywhere.

MACHINE SHOP.

The machine shop is at present under Mr. U. J. Bilodeau, who is classed as foreman. He has been in charge of the shop since August, 1910. The machine work is very good and the management is as good as could be expected under present conditions. This is undoubtedly the best managed department of the whole yard. The equipment of shop is very good though somewhat crowded. The machines are all in very good shape with the exception of one or two old machines which should be discarded and new ones purchased. The machines are nearly all running too slow and should be speeded up and high speed steel used for all tools; there is very little of this in use in yard at present time. The staff of the machine shop at present consists of one foreman at \$166.66 per month, 45 machinists at \$1.70 to \$3 per day of ten hours, 31 machinists' helpers at \$1.35 to \$2; 15 apprentices at 50 cents to \$1.05, and ten labourers at \$1.35 to \$1.70, making a total of 107 men in the machine shop. The machinists and machinists' helpers do all the important machine work, the apprentices are supposed to be learning their trade and act as assistants to machinists; the labourers are used for all heavy lifting work, moving castings, &c. We consider that these labourers should be done away with altogether, and when any labourers are required for heavy work the foreman could obtain them from the yard foreman. The machine shop is reduced to about 95 men during the summer months, men being taken on from the fleet for winter repair work. The machine shop is well up with its work, having all the repairs to fleet practically completed, and the new construction work well under

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way. All parts made for new construction when completed are stored in a shed provided for this purpose; the shed should be equipped with a small derrick for lifting heavy pieces of machinery to and from the industrial railway thus saving a great deal of time in handling. The machine shop is somewhat cramped, there being very little space in the shop itself for storing even small pieces while waiting to be assembled. The fact of machinery having to be taken from shop and stored in a shed makes the cost of these machines higher on account of the double handling. The work could be better timed so that when a piece of machinery is completed it should be put right on the vessel. The shed where the machinery is stored instead of being some place near construction work is located further away from this work than the machine shop itself. All work is done on job numbers. On the completion of any work the foreman informally notifies the Assistant Director who gives orders to have the machine stored in shed or placed on boat as circumstances demand. On repair work, the foreman when repairing any part of an engine, steering gear, &c., completes the work and notifies the Assistant Director as before. All repair work to each boat is done on one job number, so that there is no means of checking up what the repairs to any particular part of machinery or hull costs; this should be subdivided.

The machine shop is practically divided into two parts, one part where all heavy work is machined and a second part where small parts are machined and most of the repair work is done. All engines, winches, &c., are assembled in this second part and go from here to the shed or the vessel.

The two parts of the machine shop are almost as badly separated as if they were in two separate buildings as is shown on the plan marked Appendix "F."*—Large castings are machined in shop marked "A" on above mentioned plan; to get these large castings into the assembling shop it is necessary to take the casting out the large door at end of shop "A" and go around through the yard to the farther end of shop marked "B." This work is all done by labourers attached to the shop.

The machines are driven by one motor belted to line shafting running the full length of each shop. The more modern practice is to run all large machines by individual motors, group all small machines together, and run such group with an individual motor. The heavy castings in central body of shop marked "A," where all the heavy tools are, are handled by a small travelling crane having 5-ton chain blocks attached to same. This crane is operated by hand for all lifting and transverse motion. The longitudinal movement of the cranes is accomplished by a belt from the line shafting operating a small drum, a wire rope being attached to the crane and passing over a pulley fastened at each end of machine shop. The operation is slow and when any heavy castings are being moved along the speed of the line shafting is slackened, thus slowing down all the machines on this shafting. This arrangement is obsolete and could easily be improved upon. The appearance of the shop, though somewhat better than the others, is far from clean and tidy. The shop has on its list a sweeper, but it is quite evident from the appearance of the shop he does not attend to his work. Each shop both "A" and "B" has a separate tool room; these rooms should be combined and put in charge of one man. No proper record is kept of tools, no record being taken when a tool is given out or returned to tool room. A record should be kept so that the foreman should be able to tell at a glance where every tool in the shop is. The tool room in shop marked "B" was wide open when we visited the shop on Sunday, and there was not a watchman in sight. In the tool room in shop "B" a man is kept to look after the tools, sharpen them and keep them in repair. All the tools should be put under this man's care in one room, and he should be responsible for them in every way. All machines in the bays of shop "A" and out of the reach of the travelling crane have large chains suspended from the beams above for the purpose of using chain blocks on heavy work; these chain blocks have to

* Not printed.

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shifted from one place to the other as occasion requires. We consider it would be advisable to install about two small wall cranes for handling this heavy work. The list of machines and condition of same are shown in pages 85 to 87. A large new chuck lathe was recently bought and was installed on a wooden foundation; this lathe when run at a high speed vibrates too much to do good work; this machine should be installed on a solid concrete foundation. They have a number of tail shafts for tugs, &c., which are about 25 feet long, while the longest lathe will only handle 20 feet. We consider it would be advisable to exchange this lathe for one capable of taking the longest shaft they require. The employee running the milling machine had made up a number of small milling machine tools, but they are of very little use on account of not having been hardened properly. We consider that this is a waste of time to make these tools as they could be bought much cheaper from the manufacturers. The foreman of the machine shop looks after the three boilers located in the building between the two shops. They have two men firing on these boilers, while we consider one should be sufficient. There are no records kept as to when machines were bought, price paid for machines, or the size of machines; these should be all kept on a proper card index system.

If the yard is to be run as a repair yard only the machine shop is well enough equipped, and we would not recommend any changes in the shop. If the yard is to be run as a construction yard as well as a repair yard we would recommend that the travelling crane be electrified and the crane extended so as to embrace both shops. This would necessitate the cutting of an archway in building between two shops, the removal of one floor in this building and the removal of the pattern shop floor over the assembling shop or shop "B." The engines and generators in the building between the two shops could be removed to the present power house for breakdown service, the old Corliss engine could be disposed of and the boilers could be all put into one firehold instead of two as at present. The pattern shop would have to be removed, but space could be easily found for this, such as the old mould loft. The space between the two buildings could be used to good advantage as a tool room and an office for the foreman where he could see the whole shop at once. About two small wall or post cranes should be installed over the large machines in bay of shop "A." There is an assistant foreman in this shop who also looks after the men's time; he would not need to look after the men's time if each man made out a time sheet each day.

PAINT SHOP.

This is a comparatively new building, the lower flat being used as the paint shop and the upper flat as moulding loft. The paint shop is well run under the present foreman, who seems to know his duties. We think at the same time that the number of painters employed, viz., 57, is excessive. This man complains very much about the poor quality of paint supplied to him. To overcome this we would suggest that a yearly contract be made for all kinds of paint, varnish, putty, oil, &c., that samples be called for along with the prices, the prices be kept at Ottawa and the samples classified and sent to Sorel, and the foreman without knowing the prices to make tests of each on pieces of wood; this would take a little time, because each coat must be put on and allowed to dry properly, rubbed down and the next applied; after the samples have all been tested the foreman to make up his mind which is best and notify the Director accordingly; then the contract is fixed for a year and no more trouble. Next year if prices suit testing does not require to take place.

We also notice that the men take about ten minutes before knocking off time, proceeding to the shop with their pots and brushes to have them replenished against starting. This is all a dead loss of time. A quantity of paint and accessories should be kept on the job, and the men get what they want right on the spot. A clerk is essential for this department provided he does all the weighing out of materials to the men and

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keeps a proper record which the foreman should sign and return to the office. Time keeping of the men on different jobs should be kept on daily time sheets initialled by the foreman and returned to the office.

BLACKSMITH SHOP.

The blacksmith shop is a wood building one story high, about 80 ft. x 60 ft., and contains 10 forges, 2 steam hammers and 2 electric hammers, a vice or two and a weighing machine, 4 hand cranes from 1 to 3 ton, motors, blower, foreman's office, template shed, tool house, coal shed and horse shoers' shop, all as shown on plan. This shop is in charge of S. Chautauvert, who is classified as foreman. This department is certainly the dirtiest, worst kept place of the kind it has ever been our lot to see. The place is black as night, dirty and swarming with men. Generally speaking about half the number of men employed are seated or reclining on comfortable seats and benches with backs to them, quite openly. The men are quite apathetic and take little or no notice of any one coming in. The foreman is there, and he is more to blame than any one else. In our opinion he has been too long there, and far too familiar with the men to have any control over them.

The hammers are too light, the heaviest being about 1,100 lbs., and they are not kept in good order, steam and oil escaping in all directions. The shop wants to be scrapped and a new one built (it is very old and charred and burnt) with proper light and ventilation instituted.

They do a great variety of work all of a light nature such as forgings for main engines, winches and dredging plant.

The staff of this department comprises 1 foreman, 1 boilermaker, 20 helpers, 1 labourer, 11 blacksmiths, 1 clerk—a total of 35 men. We would suggest to cut this down to 8 smiths with a helper each, 1 handy labourer to keep the tools in check and clean up the shop, and a boy for each of the hammers; dispense with the clerk, and make the foreman keep a record of forgings made with their weight, and make the men fill up time sheets stating the hours worked on each job, these records to be certified by the foreman and returned to the office daily.

SHIPYARD.

This department is supervised by a foreman named A. Gendron who has 8 assistants under him, 1 clerk, 3 messengers and 147 labourers—160 all told.

The foreman, in our opinion, is well qualified for his duties, and the way he works his men is he splits them up into gangs of from 9 to 14 with a man in charge of each lot. He moves all heavy weights, puts engines and boilers, masts, machinery, &c., on board the various boats, but what he wants 147 labourers, 8 assistants, 3 messengers and a clerk for, we cannot understand. We would recommend cutting down the assistants and men about half, cut out the messengers and clerk altogether; make the foreman do more work himself, the men to fill in day time slips which he would sign and return to the office. This department is like all others, over-stocked with men. This foreman is also responsible for the number of horses (11) in the yard, it being generally his work they are employed on. We really think the number of horses could be curtailed without interfering with the carrying out of his work.

SAWMILL.

This is practically a new department having until recently been under the direction of the foreman carpenter. The sawmill is under E. Lachapelle, who is classed as foreman. The sawmill is located in a building with the joiner shop, the joiner shop occupying the upper floor. The sawmill is very well equipped, the machinery

being up to date and all in good shape. The logs all come in by water and are carried into the mill on a regular hauling-out way with endless chain. All the lumber used in the yard except for moulding left is cut up in the mill from either square or round logs, the slabs being burned in the boilers. The shavings from all the machines are at present gathered up by the labourers and put into an exhaust fan and discharged through a wooden box into firehold No. 2. They have a system of shaving exhaust pipes over each machine, but this is discarded as the fan did not carry the shavings away properly. This is largely due to the piping not being designed properly and the fan being a little too small. This could easily be remedied and do away with the necessity of gathering up the shavings as at present. All the slabs from the mill are thrown outside in a pile, gathered up, placed on an industrial railway car and run by hand down to the firehold and there unloaded and burnt. These slabs could very easily be carried to the mill with practically no handling by a belt conveyor at small expense. The logs are sawn up by a hand saw in summer time and by a circular saw in winter time, on account of the logs being frozen.

The sawmill when not working on any particular construction work cuts up lumber for stock. The stock of lumber is extensive, having lumber one, two and three years old. The mill is all run from two large motors belted to line shafting in the basement. We consider that it would be better to have individual drives as the machines are all slowed down when a large log is being cut.

The industrial railway running from the sawmill to firehold No. 2 is the only part of the yard system that is kept cleared during the winter months, and this is only used for carrying slabs to the firehold.

On one occasion we visited the mill and found only one man working on some bench work. This man when he thought we were not looking tapped on the office window, which has frosted glass and should be changed to clear glass windows, and immediately the men came trooping out like rabbits, the office was full of them including the foreman; of course they all were busy in a few moments.

The staff in the sawmill consists of 1 foreman, 1 clerk, two carpenters, 15 helpers and 7 labourers—being 26 all told. The mill could be just as well run with half this number and does not require a clerk.

JOINER SHOP.

The cabinet shop is located above the sawmill and is under the foreman carpenter. The equipment is very good, and all the machines are in very good shape. The shop is run by a belt from the sawmill. The joiner shop makes all cabin work, sashes, doors, &c., for the construction work. When the men are not working on construction work they make chairs, tables, &c., for outfit of vessels. There is a file shop in connection with this department located at the end of this shop. This file shop does all the brazing of saws, sharpening of knives, saws, &c., for sawmill and joiner shop, and is in charge of one man whom we have never seen doing anything while we were around; this man should be given some other duties and could act as clerk for joiner shop. This staff is included under the carpenters. In the event of the yard going into construction work, to fulfil the requirements of vessels such as the government are asking tenders on at present time, this shop would have to be enlarged and some new machinery installed to do the necessary joiner work, and run as a separate department with a foreman in charge.

PATTERN SHOP.

The pattern shop is located above the assembling part of the machine shop. The shop is in charge of O. Gauthier, who is classed as a foreman. All patterns required for new construction are made here and are made from drawings. All patterns for repair work are made from the broken parts or from drawings. The equipment is very

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good and all in good shape. One wood turning lathe is placed very close to a post so that it is impossible to get large work on the lathe. The shavings and sawdust are all gathered up by an old man who is employed for this work; the shavings are dumped over the stairway and are then carted to the firehold. These shavings could very easily be handled by a small exhaust fan discharging into a storage bin and dumping into wagons from a chute and carted to firehold. The work turned out is very good, but like all the other shops is costing too much. The foreman seems to spend a great deal of his time going around the yard looking after his men who are out on the fleet making patterns for repair work. The pattern makers should not have to do this at all, as a draughtsman from the drawing office should be sent out and make sketches of any repair work which require new patterns.

The stock of patterns is very large and distributed over two different buildings. Three floors of the old power house, that is the building between the two machine shops, is used for patterns and also a separate building, No. 19 on plan, has four floors covered with patterns. The patterns are laying all over the floors, hanging up on nails, hanging on posts, and a very few on wooden shelves. The patterns are numbered at present according to construction and drawing numbers. There is absolutely no record kept as to when pattern was made or where it is to be found. They have one man who looks after all these patterns, and is well informed himself as to where a certain pattern is to be found, but we do not see how anybody else would ever be able to find any pattern required. He gives all patterns out and returns them to stock, keeping a sort of record as to when a pattern is sent out, to whom, and when returned, with the weight of the casting. The patterns should all be put on shelves, properly numbered, sorted out and indexed so that they could be located by anybody. The patterns too large for shelves could be arranged much better than at present. Some of the patterns are located directly over the boiler room, and it makes a rather warm place for patterns. The water pipes in this room were sweating and the water was dripping on the patterns, and will doubtless damage them, but nobody seemed to notice this. The staff consists of 1 foreman, 1 helper, 1 apprentice and 8 pattern makers, making a total of 11 men. This staff could be reduced to about 5 pattern makers and do the work satisfactorily.

ASBESTOS.

This is a small department composed of 1 foreman and 5 men, although at times there are as high as 22 men employed on the work, the majority of whom are labourers. The department is in charge of H. Legault, who is classed as a foreman. The department is located in one end of the paint shop building, occupying two small rooms about 20 ft. x 20 ft. each. One room is used as a storeroom for cement, fire clay, asbestos plaster, asbestos board, lime and pipe covering stock. This stock is all entered on the stock room books, and the foreman is supposed to make out a requisition for all material used. All this stock should be put into the general store, and be directly under the supervision of the storekeeper. This department does all the pipe covering, boiler covering and insulating work required for new construction and repair work. They also do all brick work such as making fire arches in boilers, &c.; they do all the concrete work required in the yard, and all the cementing in ships bottom. They have two mixing boxes, and one steam drying oven for drying out the pipe covering they make. All pipe covering required in the yard is made in this department, the department having pipe covering moulds for all sizes from 2 to 5 inches; the work is all done by hand. When the men are not engaged on construction or repair work they make up pipe covering for stock. They utilize all the old material taken from boilers, steam pipes, &c., working this up again and mixing new material with the old, the working up of old material requires a great deal of time to do it properly. The material looked to be very poorly worked, large lumps of old

material being plainly visible in the mixing box. The covering itself is very poorly finished and does not in any way compare with that manufactured by any reliable concern. They have a large stock of all sizes on hand averaging from about 400 to 1,000 feet of the different sizes, and they are continually adding to this stock. This pipe covering if properly made does not require skilled labour to apply, the only part where skilled labour is required is for the covering of tees, elbows, special fittings, &c. The cost of this material is on an average 50 per cent higher than it could be bought from private concerns. All the pipe covering is made in moulds, put in the oven to dry, then clamped up in a wooden box and slit by an ordinary hand saw. The steam is apparently kept on the oven all the time, for any time we visited the department the steam was on full blast and nothing in the oven or nothing being made. We have visited the department when only one man was working there, the rest working on the fleet looking after the work there.

In our opinion this is an unnecessary department, as a very much better quality of pipe covering can be purchased as required from private concerns. The work could be put in charge of the steamfitter or could be done by contract. Should the department be put under the steamfitter it would only require about two skilled workmen to do the special work, the rest being done by labourers under the direction of the steamfitters, and the concrete and cementing work could be attended to by the yard labourers. In fact cementing of the bottoms inside could be dispensed with entirely in boats working in fresh water, and where cement is required half the quantity used would meet the case.

STEAMFITTER AND PLUMBER SHOP.

This shop is located at one end of the old boiler shop and occupies two floors. The shop is in charge of J. Langlois, who is classed as a foreman. The department does all piping, including bilge and ballast piping, plumbing and tinsmith work for the yard and the fleet. The shop is very well equipped and the machines are all in fairly good condition. The tinsmiths when not busy on construction work spend their time in making up for stock, galvanized iron pails, tea kettles, drinking cups, &c. We consider this an expensive way of obtaining these articles, as they could all be bought much cheaper outside. A list of these articles with yard prices and manufacturers' prices is shown on pages 132 and 133. The quality of the goods made in the yard is not by any means up to standard, being all hand made and are made in two or three dozen lots. Modern plants have up to date machinery for all this class of work and can make it very cheaply. There is a clerk who apparently has very little to do; he looks after the tool room, where they have a supply of pipe wrenches, pipe cutters, &c., but no records are kept of them. He also keeps track of the men's time on the different work, which is sent to the cost department each day. The place is exceedingly dirty and untidy, pipe and fittings lying all around the place and no record kept of them. The machines are all covered with oil and dirt and look as though they were never cleaned. It seems to us that the clerk could very well spend some of his spare time in keeping the machines clean and the place tidy. The upper part of the shop is almost entirely devoted to tinsmith work. There were, as usual, a number of men sitting around doing nothing when we visited the place. There were two men working, one making up a galvanized iron pipe and hood for the kitchen of one of the tugs, the other man was making a tool chest for the use of the steamfitters work on the fleet; these should all be made in the joiner shop where they have the proper equipment. This man, who is a carpenter, is attached to the steamfitters' staff for purposes of boring holes and shoring up pipes wherever needed. This is, in our opinion, entirely unnecessary as there are plenty of other carpenters around the place. There are a lot of old and out of date fire extinguishers hanging around the place. These should be re-charged and put into service or

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scrapped. The equipment for the tinsmiths is very good for the work they have to do, and is all that is required. They have an old coke soldering iron furnace which is placed on the end of a wooden bench with a piece of iron under the stove. The furnace is all cracked and broken and looks as though it might fall to pieces at any minute. We consider this very dangerous on account of fire. The staff consists of 1 foreman, 1 clerk, 2 apprentices, 1 carpen' r, 22 steamfitters and 1 plumber—all told 28. We consider that 15 steamfitters could handle the work just as well as at present.

AIR SYSTEM.

The compressed air is supplied by three different compressors, one located in power house, one located in machine shop and one located in boiler shop. The different compressors all pumping into a common main. The compressor in power house is a 12 x 19 x 18 Canadian Rand drill compressor running at 100 R.P.M. and delivers about 6 cubic feet of air per revolution at 100 lbs. pressure. The compressor in the machine shop is a 12 x 12 x 14 steam driven air compressor manufactured by the Fog Signal Co., of Toronto. This compressor was only running at 56 R.P.M. when we drew their attention to it and it is now running at 120 R.P.M. This compressor should deliver 2 cubic feet of air per revolution. The compressor in the boiler shop is the same as the above, that is a 12 x 12 x 14, but is electrically driven and is running at 136 R.P.M. The total amount of air delivered per minute should be approximately 1,100 cubic feet at 100 lbs. pressure. The pressure in the power house is very seldom above 80 lbs. and we have seen it as low as 48 lbs. This is not conducive to good work. The pressure should at all times be at least 100 lbs. in the power house. All large rivets have to be driven at night so that there will be sufficient pressure. The air compressors are not large enough for the number of pneumatic tools which are in use in the yard. The two small compressors should be disposed of and another up to date electrically driven air compressor should be installed. The air is piped to all construction work and has outlets well distributed over all new work. The air piping should all be gone over and tested for leaks. The number of pneumatic tools in use in yard is shown on page 84.

STEAM DISTRIBUTING SYSTEM.

The steam is supplied from two different sources in the yard. There is a battery of three return tubular boilers, having a working pressure of 120 lbs. with a steaming capacity of about 10,000 lbs. of steam per hour. There is a battery of two locomotive boilers located in firehold No. 2, having a steaming capacity of about 11,000 lbs. of steam per hour. The steam is used for dry kiln, heating, steam hammers in blacksmith shop, air compressor, &c. The principal item is heating, there being about 4,000 square feet of heating surface in the yard. The steam pipes consist of wrought iron pipes and are laid in the ground without any insulation. All condensation is trapped to sewer and is a total waste. We consider that the piping should all be properly insulated and all the water of condensation should be returned to the boilers. Should this be done we venture to say that heating expenses would be reduced at least 50 per cent. The total amount of coal used in the yard boilers for one year is, as far as could be ascertained, as there is no reliable check on this, about 1,200 tons. The cost of coal is \$4.10 per ton, delivered on the yard wharf.

WATER AND FIRE PROTECTION SYSTEMS.

All the water used in the yard is taken from the Richelieu river at the upper end of the yard, above the sewerage disposal of the yard and Sorel. The water is pumped

from river and distributed around the yard by two centrifugal double stage electrically driven pumps. Only one pump is used at a time, and is all that is necessary for the daily needs of the yard; each pump has a capacity of 500 G.P.M. The water is used for boilers, toilets and wash basins in office; the slops have no accommodation for men to wash up.

The fire protection is fairly good, having besides the above mentioned pumps one steam driven Fire Underwriters' Pump of 500 G.P.M. capacity, located in the building between the two machine shops. The majority of the buildings are equipped with stand pipes and 50 feet of hose on brackets. They have thirteen 4-in. fire hydrants distributed throughout the yard. The yard has two hand fire reels, each having 200 feet of rubber lined hose. There is no regular fire brigade organization, the head steamfitter and his men are supposed to look after all fires. A regular fire brigade with occasional fire drills should be organized; the alarm in case of fire, consisting of the blowing of the yard whistle. We consider that the yard has been very fortunate in the small number of fires which have taken place on account of the amount of smoking going on in the yard. The village of Sorel has one fire engine and two fire reels which can be called on in case of fire. A number of up to date fire extinguishers should be installed in easy accessible places in all buildings. The system should be periodically inspected by a competent man.

OLD BOILER SHOP, No. 1.

1 shears 51-in. gap, 30 strokes per minute—good machine.
 1 vertical punch, 48-in. gaps, 31 strokes per minute—good machine.
 1 vertical punch and shear, 27-in. gap, 16 strokes per minute—poor machine.
 1 wall counter-sinking machine—good machine.
 1 set rolls outside the shop 10 ft. 0 in. x 10 in. old, hand-screwed gear, not good, too old and slow.

2 time-keeping clocks in this shop. The doors of this shop are locked 10 minutes before the whistle blows for stopping and every available approach is packed with men waiting to make a rush when the doors are opened to get in to punch their card. The men are all knocked off in the mould loft above and standing on the stairs. It does not seem to us that the men work any at all after it comes within 15 minutes of knocking off time, and how they make a start after the whistle blows for commencing work, we do not know, as we were afraid to poke in too much for fear of upsetting the men and causing friction.

The shop is kept in a very dirty, untidy state, very much in need of whitewash. On a visit March 21, 11.30 a.m., counted 20 men sitting and lounging around. This is one of the worst places in the yard for loafing.

The handling of plates at the punches and mode of procedure in this shop is the same as No. 2—two to three times as many men as are necessary.

In making these statements due allowance is made for routine. We know that every man cannot be always with his back bent, and there are times that the men have to hang on, but we know all about that sort of thing and are making due allowances.

Punches here are all centred same as other shop which is not required for ordinary work.

These boiler shops will never be any better until piece work is introduced. It is an utter impossibility to run a shipyard any other way than by piece and keeping a daily tally of the amount of work the men do.

Furnaces.

Plate furnace 20 ft. 0 in., mouth 5 ft. 6 in. x 2 ft. 2 in., 1 fire.
 Angle furnace 40 ft. 0 in., mouth 2 ft. 6 in., x 1 ft. 3 in., 2 fires.
 Both are good furnaces and heated by coal fires.

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Bending blocks 50 ft. 0 in. x 30 ft. 0 in., in good order.

Jobbing blocks 10 ft. 0 in. x 7 ft. 0 in., in good order.

1 hand jib crane for handling plates at jobbing blocks—not much account—obsolete.

1 cold saw—too much of a toy—too small and neat for rough shipyard work, especially to be sitting outside.

There are no means of handling plates hot or cold, seems to be all hand labour, which is a serious matter in furnace work.

They might at least have a winch at the opposite end of the blocks to pull out and in plates and angles from the furnaces.

This place is kept in a very dirty state.

Have counted repeatedly from 6 to 12 men seated and standing around a fire at the back of the furnaces, which is placed there for the purpose of keeping the loafers warm; seats are everywhere in evidence.

Away at the back of the furnaces it is very dark and dirty. Over the furnaces is a space for stowing old templates. These are nicely fixed up in various ways to screen men loafing. This place is also very dark and in want of whitewashing.

An electric light is kept burning all day Sunday at the back of the boilers.

We are told angle iron smiths cannot be got in Sorel; that is a very great pity and the statement is very open to doubt. These men can be got well enough if they are asked for.

All flanging of plates is done at these furnaces—no appliances. (See note on rolls in No. 2 boiler shop). This note would apply to the 10 ft. rolls nicely.

Air Tool Repairing Shop.

This is entered from No. 2 boiler shop and the entrance is kept locked and the place seems to be well managed.

3 vice boards.

1 double emery wheel.

1 small lathe.

1 chaper.

1 screwing machine.

We have generally noticed 4 or 5 men and 1 boy in this shop and have never seen any loafing going on, probably because it is all screened in with open wire and the men can see any one coming.

NEW BOILER SHOP, No. 2.

This is a comparatively new erection and very good. The roof is composed of iron trestle work carried on upright iron beam, forming girders for carrying the three travelling cranes. This is a first-class shop in every way, plenty of headroom, light and ventilation, but like all the other buildings in the yard, is kept in a very dirty and untidy state. Men have to pick their way over heaps of iron cuttings, angles, &c., and run very grave risks of breaking their legs; in such a case we presume the Government would be responsible.

Planing machine, open ended, with travelling cutter and 4 screw jacks for keeping job in place—good machine and in good order—motor driven.

Rolls—12 ft. long, top roll 22 in. dia.—very good and in good working condition.

We consider it a huge mistake to buy a set of rolls of this value less than 28 to 30 feet long. The top roll ought to have a slot cut in it for flanging plates. This would save a mint of money as plates could be flanged in thousands of cases instead of fitting angles on the edges and would save tons of material in the construction—meantime if they want to flange a plate it has to be done in the furnace and flanged by hand.

The rolls are very badly placed for general work; they are only useful for boiler-making, and are motor driven.

Rolls alongside the large ones 2 ft. 10 in. long worked with a ratchet—these are only toys and of very little use.

Motor and air pump placed near the rolls—a very good pump and seems to work well, but very much too small.

Overhead crane over the boiler under construction, lifts 30 tons with hand power for lifting and traveling. This is a good tool, but not nearly heavy enough for handling boilers; ought to be an electric crane capable of lifting a boiler shell for rivetting purposes; as it is the boilers have to be rolled about for rivetting, and when the time comes to remove the boiler to the ship half the shop is stopped; it takes three to four days to remove a boiler and place it alongside the ship.

The boiler makers appliances are very poor. All flanging done is by hand. The boiler heads are bought flanged ready for fitting which is good and saves a lot of money and time.

The rivetting appliance is not anything like adequate. The rivets are put in under air pressure and has to be done at night because the pressure is not sufficient when other tools are working. The pressure during the day varies from 45 to 70; at night time, when all other air tools are stopped, 100 is available. Night work like this increases the cost about 100 per cent. Hydraulic rivetting should be introduced; it makes by far the best boiler rivetting. This would mean a new set of pumps and an accumulator.

A small air lift is attached to the 20-ton crane; lifts about 3 tons which is very useful.

Hydraulic coping machine—is a very poor tool, slow in action, and will not cope a channel smaller than about 8 inches; even then it does not cut clean into the root of the bar, and is therefore of very little use. Hydraulic cutting machine for channels, H. beams, &c., is good, but very slow for heavy work. To cut a channel bar 12 x 4 x 4 x $\frac{3}{4}$ takes 1½ minutes to go through; it however makes a good clean burst cut, and would be very useful if placed in a better position.

The hydraulic pumps have no accumulator and are only used for the two above machines and are said to be 1,800 lbs. pressure. Three vertical punching machines each with 48-in. gaps (all good)—one runs at the rate of 24 holes per minute, another 34, and another 36, but the men in punching set off and on at every hole and only punch holes at the rate of about 16 to 18 holes per minute. All the class of work done which came under our notice should have been punched at full running with no setting off and on; and the number of men handling the plates is very excessive, 10 and 11 men being at the work when 4 is quite sufficient.

One shearing machine with 48-inch gap and 29 strokes per minute. This is also a good machine and the note as to number of men applies here also.

One horizontal punch which is broken down and has been standing idle for three months waiting on repair parts coming for it.

One double angle cutter—a very good machine only the cutters are too high above the ground and the men have no means of handling the bars properly. Under observation it cut angle bars 5 x 5 x $\frac{3}{4}$, and made a very good clean square cut.

One smaller vertical punch—runs at the rate of 20 holes per minute—this is an old machine patched and not of much account except for light work.

Three radial drills—all very good and in good order—one vertical drill for jobbing—this machine is old but all right.

Two overhead travelling cranes, each capable of lifting 5 tons, both having hand power for lifting and travelling—these are good tools and very useful—they are worked by a man instead of a boy. (Boys are very scarce all over the yard). Men are employed to do boys' work in innumerable instances.

Two wall countersinking machines—both good and in good order.

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Narrow gauge railways run half way through the shop, but were never used during our visit to the yard.

The whole shop is very untidy and badly kept and considering the excessive number of men lounging and sitting about, this is unpardonable.

The system of marking off plates for cutting up is most elaborate. The plates are all lined off from templates the shape of the part to be cut off. Round holes and even the marking of the plates in figures are all close centre punch marked which takes a long time to do and is useless and the gang of 8 and 10 men stand around waiting till it is done, to the entire satisfaction of the operator. One plate under observation, about 14 ft. long x 36 in. x $\frac{9}{16}$ was all marked as above; then the men gather around the plate and move it by slow degrees on to the roller bogies for taking the weight of the plate. While punching there were 9 men round this plate; 4 were quite sufficient; then the punching goes on, setting off and on at every hole. The proper way would be to punch the plate at full running power with no setting off and on. All the punches are centred, which is useless except for very exact work on boilers. This centre dabbing all takes time and is never resorted to in modern ship building practice. All this waste is due to want of knowledge and proper supervision.

Seating accommodation for the men and fires to keep them warm are plainly visible and padded stools for the punchers; things unheard of in well regulated boiler shops.

There seems to be an unusually large number of old frail men—locks as if they were pensioners.

Various new modernized tools could be introduced into these shops which would reduce cost of work, such as manhole punching and frame joggling machine, hydraulic ram for frame setting, sidelight cutting machines, small hydraulic bears for odd work, and many small ideas introduced if only the man was there to introduce them, all going towards reducing the cost of production.

ELECTRICAL DEPARTMENT.

The electrical department is spread out over four different floors at different levels. On same level or floor of machine shop there is a small room about 15 feet square with an entrance into machine shop. They do all the motor repair work and use this door for taking motors in and out. No attempt is made to keep things neat and tidy and so one could lay hands on anything desired. Half way between the machine shop level and the pattern shop, which is above machine shop, is another small room which is used by a man styling himself assistant foreman. He has a small office here and keeps a few small stores, looks after the men's time, goes out around the fleet to see how work on fleet is going and personally looks after the repairing of the voltmeters and ammeters belonging to fleet, and in fact seems to run the department in general. He also allots the men to the different jobs so we cannot see that there is very much left for Mr. Cote to do although he is the head electrician. He seems to occupy the position of a consulting engineer, but in our opinion could be more useful elsewhere. On the same level as the pattern shop is a general repair shop where they do nearly all the small repairs to arc lamps, clusters, headlights, &c. They have an average of 75 to 80 arc lamps belonging to the fleet to overhaul during the winter months. They also have what is termed a telephone exchange on this floor for the inter-communicating system which is in use throughout the yard. This exchange is necessary on account of having twenty phones in use in yard and the plug boxes in the different departments are only capable of reaching sometimes 10 and sometimes 15 phones, so that to get other departments they have to ring up this exchange and ask for connection to party desired. It would be advisable to do away with this system and install more lines and make all the plug boxes capable of hand-

ling twenty phones. They have another small store and tool room here which are looked after by the man who attends to the telephone exchange; he does other odd jobs besides and is really necessary under present conditions; but we consider that these two store rooms should be combined and he could look after the men's time as there are only about 15 men in the department. The telephone exchange, if present system is kept, should be moved into this store room. The assistant foreman should not have any of this work to do and his office halfway between floors should be abolished as he can't see what men in shop are doing from his office. On a level above this is another floor used as a sort of storage room for arc lamps, searchlights, &c. There is also a room designated as a test room all partitioned off from the other room, but the testing equipment is very meagre. The only standard instrument they have is a Wheatstone bridge of 50,000 ohms capacity. It seems to us that this room is entirely uncalled for. Mr. Cote has a nice comfortable place here besides having an office in the general offices. He indulges in the pleasure of smoking here which is not a very good example to the men. The place throughout has no attempt at tidiness, and wire and things are lying around all over the place. They keep very little stock, getting it all from general stores when required. The work done by the department consists of installing arc lights, motors, wiring, dynamos, &c., in the yard, on new construction and on the fleet, keeping all electrical apparatus, wires, lights, &c., in repair in yard, and doing all electrical repair work on fleet in winter time. The yard has 16 D.C. motors 110 volts, 5 A.C. motors 440 volts, and 5 A.C. motors 220 volts. This gives them three separate motor circuits which, in our opinion, is a mistake. A.C. motors should be used wherever viable speed is not desired and they should all be of same voltage. They have one man who spends all his time looking after the motors, which we consider is not necessary in such a small installation of large motors. They keep two men on the fleet during the winter time who are supposed to do all temporary wiring for repairs and new construction work; we doubt whether one man could put in all his time on this work. There are only about 150 temporary incandescent lights on the fleet at present. The men have little electric stoves and heaters made up for their own convenience, such as making tea, &c. Mr. Cote stated that he could run the place just as well with 5 good men, and we agree with him, but would not state that any of the men he had at present were no good. The electric current is paid for on peak load and at present at peak of 550 H.P. per month at the rate of \$36.50 per H.P. year. The highest peak load they ever had was 625 H.P. but only for 2½ hours when they were sawing some frozen logs in the mill. The power is supplied by the Sorel Electric Co. who have a recording watt meter in the yard power house. They are supposed to take the records away each day. The meter is not accessible to the yard but they can check same from instruments on switchboard. The meter has not been running since we came to yard. The electric company had it away repairing same and have never started it up again and nobody seems to care, in fact the chief electrician didn't know it was not in use until we asked him why. They have a number of A.C. motors, but have no A.C. portable instruments.

They make small switchboards required for the fleet and claim that they make them cheaper than they can buy them. The men work on repair work in winter time and new construction in summer. Any machine work they require they have to go to machine shop for. We think it would be a good thing for the electrical department to have a small lathe of its own for turning commutators on, &c. At present they have a number of small electric drills fastened to the bench and use these for small work. Mr. Cote claims, as he can't specify the kind of goods, he sometimes gets goods that are not suitable for work. The electric wires are all run overhead on poles and on the ceilings of the different buildings, fastened with porcelain cleats, no conduit being used. We consider it would be better to run all these wires in iron conduit. The staff of this department: 1 foreman, 12 electricians, 1 labourer

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—making a total of 14 men. This could be run as well with 6 or 7 electricians. A list of motors with their sizes and locations is given on page 88. A list of transformers with their size is given on page 88. See Appendix 'G' for form of contract.

POWER HOUSE.

The power house is under the chief electrician and has two men employed in it. One man attends to the switchboard, starting of motors for sawmill and the starting of motors for centrifugal pumps for house and fire service. The other man looks after the air compressor. We consider that this could all be attended to by one man. The equipment in power house consists of one 12 x 19 x 18 Canadian Rand drill compressor, Class d.2 running to 95 R.P.M. The air supply is altogether too small for the number of tools in use, the air pressure in power house being only 70 lbs. and sometimes 60 lbs., when for good work, especially on rivetting, it should be at least 100 or 110 lbs. The current is supplied to the board at 2,200 volts, 30 cycle, 2 phase A.C. current. They have a motor generator set for converting current to D.C. The generator set consists of a 300 H.P., A.C. 30 cycle, 2 phase H.P., 2,200 volt A.C. motor direct connected to a 200 K.W. 125 volt, 1,600 ampere D.C. generator. They cannot tell from switchboard the amount of current used in each department, and so divide cost of power as per motors in each department, which is only approximate at the best. The reading of instruments on the board D.C. current.

The centrifugal pump for house service is started from power house. These motors are 440 volts and 110 volt A.C., 220 volts A.C., and 110 volt D.C. light circuits. This is a great mistake; they should all be the same.

The motors in sawmill are 100 H.P. and 150 H.P., A.C. motors 440 volts. These motors are started from the power house. The man in the sawmill presses a button when he wants motors started or stopped. This button rings annunciator bell, the power house annunciator indicating which motor to start. This seems a very bad practice as we consider it dangerous, for if anything goes wrong in sawmill they have to run and press the button and the man in power house has to drop whatever he is at and run and shut off the motor, by which time considerable damage could be done in mill. There is also the possibility of the man in power house starting the wrong motor with serious consequences. The current on the two phase is not well distributed as one leg showed 72 amperes and the other 88 amperes which shows poor distribution. The power house is about the cleanest place around the whole establishment, and is very well kept, except for a few loose pieces of wire and things behind switchboard. The attendant seems to know his work very well as far as running the switchboard is concerned. They have a 125 H.P. 110 volt 950 ampere D.C. motor running the air compressor. This should be an A.C. motor, as it would save the cost of about 25 H.P. in the motor generator set. The distributing wires are all run exposed and held in place with cleats. These should all be run in conduit.

STABLES.

The stables are in a building by themselves and have accommodation for eleven horses, and the house is full. They have eleven horses hauling coal, material, &c., 75 per cent of which could be handled on the industrial railway which we think could be kept clear without any trouble by the eleven men required to drive the horses. The stables and horses are looked after by two men who are supposed to come in at 5 a.m. in the morning and look after the horses and harness them and have them ready for 7 a.m. and feed them at noon and fix them at night. There is no check kept on the men's time. The stables are very dirty as usual, and very poorly kept. The stable evidently is one of the favourite loafing places. The men congregate here and have a

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LIST OF MACHINES IN ENGINE HOUSE.

Name.	Size.	Condition.	Remarks.
Engine	Corliss 10 in. x 24 in. 20 H.P.	Good	Not being used. (Should be disposed of.)
Fire pumps	500 gals. per min....	"	
Ideal engine	12 x 10 280, R. P. M.	"	
Dynamo	125 volts, 400 amperes	Fair.	
Robb Armstrong, engine and dynamo.	120 " 350 "	Good.	
Switchboard		Fair.	
1 steam driven air compressor	12 in. x 14 in. x 12 in.	Good	Too small. About 20 years old; requires overhauling.
Boilers (3 off)	Return tube	Fair	
Boiler feed pump		Good.	
Feed water heater		"	
Patterns	3 flights	"	
Shafting		"	
Belts and pulleys		"	
Miscellaneous tools		"	
Sundries		"	

LIST OF MACHINES IN MACHINE SHOP.

Bolt cutter	14 in.	Fair.	
"	24 in.	"	
Small planer 8 ft. bed	8-0 x 2-0	Poor.	Should be replaced.
Lathe	8 ft. 4 in. centres 20 in. swing	Good.	
Shaper	16 in. travel	"	
Radial drill		"	
Boring mill	4 ft. 10 in. face plate	"	
Drill	21 in. swing	"	
"	21 in. swing	"	
"	21 in. swing	"	
Lathe	4-6 centres 17 in. swing	"	
Universal Miller lathe	16-0 centres 4 ft. 8 in. swing	"	
Radial Drill lathe "chuck"	6ft.-0in. centres 10 in. swing	"	
Shaper	2-0 travel	"	
"	1-4 travel	"	
Planer (large)	19 ft. 0 in. x 7 ft. 0 in.	"	Should be speeded up.
Lathe	4-6 centres 18 in. swing	"	
Lathe	7-0 centres 18 in. swing	"	
Lathe	6-6 centres 16 in. swing	"	
Lathe	4-6 centres 19 in. swing	"	
Lathe	6-6 centres 21 in. swing	"	
Lathe	8-0 centres 30 in. swing	"	
Lathe	10-0 centres 24 in. swing	"	
Lathe	4-6 centres 14 in. swing	"	
Lathe	4-6 centres 18 in. swing	"	
Lathe	20-10 centres 28 in. swing	"	
"Four" spindle drill		"	
Cold saw "Hack"		"	
Automatic cold saw, portable	18 in. diameter	"	
Planer "small"	8-6 x 2-7	"	
Labloud milling machine No. 2		"	
Drill	2-6	"	

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LIST OF MACHINES IN MACHINE SHOP—Continued.

Name.	Size.	Condition.	Remarks.
Lathe.....	11-0 centres 18 in.	Good.	
	swing		
Turret lathe	17 in. swing	"	
Lathe.....	4-6 centres 18 in.	"	
	swing		
Drill face plate	3 ft. 4 in.	"	
Lathe "chuck".....	6-0	"	
Slotting machine.....		Fair.	
Overhead travelling crane and 5 tons blocks.....		"	Should be electrified.
Shafting.....		Good.	
Belting.....		"	
Miscellaneous.....		"	
Tools.....		"	
Sundries.....		"	

LIST OF MACHINES IN OLD BOILER SHOP No. 3.

Shears.....	51 in. gap	Good.	
Punch.....	48 in. gap	"	
Punch and shears.....	27 in. gap	Fair.	
Plate rolls.....	10 ft. 0 in. x 10 in. diameter.....	"	Hand gear for lifting.
Cuttersinker.....		Good.	
Bending slabs.....	10-0 x 7-0	"	
Forge and crane.....		"	
Bending slabs.....	50-0 x 30 0	"	
Plate furnace 1 fire (5-6 x 2-2 door).....	20-0	"	
Angle furnace 2 fires (2-6 x 1-3 door).....	140-0	"	
1 cold saw.....		"	No use—too small.
Shafting.....		"	
Belts and pulleys.....		"	
Miscellaneous.....		"	
Tools.....		"	
Sundries.....		"	

LIST OF MACHINES IN PNEUMATIC TOOL HOUSE.

Emery wheel.....		Good.	
Radial drill.....		"	
Sander.....		"	
Lathe.....		"	
3 vice boards.....		"	
18 long stroke hammers.....	60 x 1 1/2 x 9	"	Cubic feet per minute 25.
2	60 x 1 1/2 x 9	"	" " 25 (special for corner work).
4	60 x 1 1/2 x 6	"	Cubic feet per minute 25.
13 chipping hammers.....	No. 2	"	" " 20.
5 No. 1 drills.....	Clw F	"	" " 35.
22 No. 2	"	"	" " 25.
4 No. 3	"	"	" " 15.
1 No. 5 drill.....	Wood boring	"	" " 20.
2 No. 2 corner drills.....		"	" " 15.
1 No. 11 tube expander.....		"	" " 35.
16 holders on.....		"	
2 hoists.....	3 tons	"	8 cubic feet per foot lift.
1 No. 2 Whitelaw bolt nipper.....		"	
2 yoke rivetters.....	1 1/2 x 6	"	
2 compression rivetters.....		"	
1 rivet buster.....		"	
Shafting.....		"	
Belts and pulleys.....		"	
Miscellaneous tools.....		"	
Sundries.....		"	
Air hose and fittings.....		"	
2 painting machines.....		Fair.	Never used.

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LIST OF MACHINES IN NEW BOILER SHOP No. 2.

Name.	Size.	Condition.	Remarks.
Angle shears double.....	5 x 5 x 2.....	Good.	
Punch horizontal.....		Fair.	
2 countersinkers.....		Good.	
Drill.....		"	
Plate rolls.....	12-0 x 20 in. dia.	"	Too small and should have a slot cut in them.
Air compressor.....	12 in. x 14 in. x 12 in		Too small.
Plate rolls.....	3-6 x 5 in. dia.	No use.....	Hand power.
Forge.....		Good.....	(For boiler makers.)
Pressure blower fan.....	6 in	"	
Hydraulic shears.....	12 x 6 x 5 x 2.....	"	
Punch.....	48 in. gap.....	"	
".....	48 in.	"	
Drill.....		"	
Hydraulic pumps.....		"	
Shears.....	48 in. gap.....	"	
Head drill.....		"	
Drill.....		"	
Emery wheel.....		"	
Punch.....		"	
".....		"	
Plate planer.....		"	
Hydraulic coping machine.....		Fair.....	Wants repairing badly.
2 travelling cranes.....	5 tons.....	Good.....	Hand power (should be electrified.)
1 crane.....	30 tons.....	"	" " "
Shafting.....		"	
Belts and pulleys.....		"	
Miscellaneous tools.....		"	
Sundries.....		"	
1 Wellstack light.....		"	

LIST OF MACHINES IN JOINERS SHOP (Over Saw Mill).

Lathe wood.....	15-0 x 20 dia.....	Good.	
Planer revolving table.....	Knife, 24 in.....	Fair.	
Circular saw.....		Good.	
Band saw.....	36" dia., wheel.....	"	
Buzz planer.....	Knife, 26 in.....	"	
Tenoning machine.....	4-0 x 18 in.....	"	
Boring machine.....		"	
Grindstone.....	21 in. dia.....	"	
Mortice machine.....		Fair.	
Sand paper machine.....		"	
Saw sharpener.....		Good.	
Forge.....	2-0 x 2-0.....	"	
Rolls for straightening band saws.....		"	
Emery wheel.....	12 in x 2.....	"	
Emery wheel.....	12 in. double.....	"	
Emery wheel.....	Special.....	"	
Band saw sharpening machine.....		"	
Shafting.....		"	
Belts and pulleys.....		"	
Miscellaneous tools.....		"	
Sundries.....		"	

LIST OF MACHINES IN TINSMITHS SHOP.

Name.	Size.	Condition.	Remarks.
Beading machine.....		Good.	
Two burring machines.....		"	
Punch.....	12 in. gap.....	Fair.	
Rolls.....	36 in.....	"	For stove pipes.
Foot Shears.....	36 in.....	Good.	
Circular burring machines.....	14 in.....	"	
Plate folder.....	36 in.....	Fair.....	Want repairing.
Plate folder.....	21 in.....	"	Want repairing.
Two turning machines.....	Small.....	Good.	
Shears.....	10 in. gap.....	Fair.	
Turning machine.....	Large.....	Good.	
Wiring machine.....	Large.....	"	
Setting down machine.....		"	
Soldering iron furnace.....		No use.....	Should be renewed.
Hand tools.....		Fair.	
Benches.....		Good.	
Vices.....		"	
Shafting.....		"	
Belts and pulleys.....		"	
Miscellaneous tools.....		"	
Sundries.....		"	

LIST OF TOOLS IN SAWMILL.

Moulding machine.....	12 in. x 6 in.....	Good.....	4 sides.
Band saw.....		"	
Planer and matcher.....	24 in. x 6 in.....	"	
Planer (revolving table).....	26 in. x 10 in.....	Fair.	
Travelling log carrier.....	60-0 in. x 36 x 2½ in.....	Good.	
Circular saw.....	60 in. dia.....	"	
Band saw.....	72 in. wheel x 9 in. wide.....	"	
Timber hauling out ways.....		"	Endless spike chain, &c.
Swing saw.....	36 in. dia.....	"	
Edger saw.....	18 in. dia.....	"	
Swing saw.....	16 in. dia.....	"	
Emery wheel.....	11 in. dia.....	"	
Grindstone.....	36 in. dia.....	"	
Fan exhaust for shavings.....	36 in. dia.....	"	Too small.
Shafting.....		"	
Belts and pulleys.....		"	
Miscellaneous tools.....		"	
Sundries.....		"	

LIST OF TOOLS IN BLACKSMITHS SHOP.

Steam hammer.....	1,100 lbs.....	Fair.	
Steam hammer.....	800 lbs.....	"	
Electric hammer.....	600 lbs.....	"	
Electric hammer.....	Small.....	Good.	
Blower.....		"	
11 Forges.....		"	
3 Cranes.....		Fair.	
1 Weighing machine.....		"	
Vices.....		"	Should be repaired and tested.
Hand tools.....		Good.	
Crosses.....		"	
Steam piping.....		"	
Miscellaneous tools.....		"	
Sundries.....		"	

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LIST OF TOOLS IN PATTERN SHOP

Name.	Size.	Condition.	Remarks.
Lathe, wood		Good	Too close to post.
Lathe, wood		"	
Band saw		"	
Surface planer		"	
Buzz planer		"	
Band saw		"	
Grindstone		"	
Patters		"	
Shafting		"	
Belts and pulleys		"	
Miscellaneous tools		"	
Sundries		"	

LIST OF TOOLS IN YARD.

Industrial railway	One mile	Good	
Steam piping		Fair	
Water piping		Good	
Air piping		Fair	
Air headers		Good	
Air hose and connections		"	
Winch, electric	1,700 tons haul	"	
Winch, electric	600 tons haul	"	
Sewers		"	
Fire protection		"	
Weighing machine		"	
2 Loco. boilers		"	No. 2 Fire hold.
30-ton Crane	Hand	"	Over railway.
Shear legs	130 tons	"	
Shear legs	40 tons	Poor	Should be thoroughly overhauled at once or discarded.
Marine railway	1,100 tons displacement		Don't have much faith in this.
Marine railway	300 tone displacement		Don't have much faith in this.
Fencing		Good	As far as it goes.
Wharfs, 4		Fair	
Wires and blocks		Good	
Tools and implements		"	
11 Horses		"	
Harness and equipment		"	
Wagons		"	
Sleighs		"	
Industrial cars		"	
Boats and punts		"	
Water closets		"	
Shelters	13	"	
Wind shields		"	
Steaming trough		Fair	
Shear legs		Good	Portable.
Derrick posts		"	
Miscellaneous tools		"	
Sundries		"	
Blocks		"	
Ways		"	
Shores, etc.		"	

LIST OF TOOLS IN STEAMFITTERS SHOP.

Name.	Size.	Condition.	Remarks.
Hand forge	Small	Good.	
Pipe machine, "screwing"	1-in. to 6-in.	"	
Pipe machine, "screwing"	2-in. to 8-in.	"	
2 pipe machines, "screwing"	Up to 2-in.	Fair.	
Drill, upright	12-in.	"	
Buffer and emery grinder combined		Good.	
Wellsbach light		"	
Pipe bending machine	2-in.	"	
Slabs for bending pipes		"	
Hand taps and dies		"	
Shafting		"	
Belts and pulleys		"	
Miscellaneous tools		"	
Sundries		"	

LIST OF TOOLS IN ELECTRICAL DEPARTMENT.

Name.	Size.	Condition.	Remarks.
Air compressor	12-in. x 19-in. x 18-in.	Good.	Too small.
Motor (power house)	125 h.p.	"	D.C. 110 volts.
Motor (power house)	3 h.p.	"	A.C. 2 phase 2200 volts, 30 cycle.
Generator, D.C.		"	200 k.w. 125 volts, 1600 amps.
Switchboard and equipment		"	
Electric lights		"	1000-13 C.P.
Wiring		Fair.	
Posts, &c.		Good.	
Telephones		"	
2 transformers	75 k.w.	"	2200/440 volts.
2 transformers	50 k.w.	"	2200/440 volts.
2 transformers	30 k.w.	"	2200/440 volts.
2 transformers	15 k.w.	"	2200/110-220 volts.
2 transformers	10 k.w.	"	2200/110-220 volts.
2 transformers	15 k.w.	"	2200/110-220 volts.
40 arc lamps	D.C.	"	
3 arc lamps	A.C.	"	
Motor and air compressor	125 h.p.	"	D.C.
Motor (sawmill)	1-0 h.p.	"	A.C. 440 volts.
Motor (sawmill)	100 h.p.	"	A.C. 440 volts.
Motor (sawmill)	5 h.p.	"	D.C. 440 volts.
2 motors (pumps)	30 h.p.	"	A.C. 440 volts.
Motor (plate rolls)	25 h.p.	"	A.C. 440 volts.
Motor (boiler shop)	7 1/2 h.p.	"	A.C. 440 volts.
Motor (boiler shop)	10 h.p.	"	A.C. 220 volts.
Motor (boiler shop)	10 h.p.	"	A.C. 220 volts.
Motor (boiler shop)	10 h.p.	"	A.C. 220 volts.
Motor (air tool shop)	5 h.p.	"	D.C. 110 volts.
Motor (steamfitter)	15 h.p.	"	D.C. 110 volts.
Motor (boiler shop)	25 h.p.	"	D.C. 110 volts.
Motor (boiler shop)	10 h.p.	"	D.C. 110 volts.
Motor (boiler shop)	10 h.p.	"	D.C. 110 volts.
Motor (boiler shop)	10 h.p.	"	D.C. 110 volts.
Motor (boiler shop)	20 h.p.	"	D.C. 110 volts.
Motor (boiler shop)	40 h.p.	"	D.C. 110 volts.
Motor (boiler shop)	5 h.p.	"	D.C. 110 volts. (For compressor.)
Motor (boiler shop)	10 h.p.	"	D.C. 110 volts.
Motor (boiler shop)	15 h.p.	"	D.C. 110 volts.
Motor (boiler shop)	10 h.p.	"	D.C. 110 volts.
2 motors (boiler shop)	10 h.p.	"	D.C. 110 volts.
Motor (blacksmith)	3 1/2 h.p.	"	A.C. 220 volts.
Motor (blacksmith)	13 h.p.	"	D.C. 110 volts.
Motor (blacksmith)	10 h.p.	"	D.C. 110 volts.
Motor (machine shop)	55 h.p.	"	D.C. 110 volts.
Call bells		"	D.C. 110 volts.

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AVERAGE RATE OF WAGES PAID TO WORKMEN.

Shipyards labourers..	\$1.42 per day of 10 hours.
Carpenters..	1.76 " " "
Asbestos..	1.61 " " "
Boiler shops..	1.49 " " "
Steamfitters..	2.02 " " "
Blacksmiths..	1.93 " " "
Electric shop..	1.90 " " "
Paint shop..	1.73 " " "
Joiners shop..	1.67 " " "
Pattern shop..	2.01 " " "
Mould loft shop..	1.76 " " "
Saw-mill..	1.60 " " "
Caulkers wood..	1.71 " " "
Machine shop..	1.90 " " "

RATES CHARGED FOR USE OF TOOLS ON REPAIR WORK, DOCKING OR SLIPPING AT SOREL SHIPYARD. (See Scale for Docking Charges.)

Carpenters..	Actual wages paid plus indirect cost.
Carpenters foremen..	Actual wages charged through indirect cost.
Joiners..	Actual wages paid plus indirect cost.
Joiners foremen..	" " " " "
Operator at machine..	" " " " "
Pipe fitters..	" " " " "
Blacksmiths..	" " " " "
Furnacemen..	" " " " "
Electricians..	" " " " "
Riveters..	" " " " "
Platers..	" " " " "
Caulkers..	" " " " "
Drillers..	" " " " "
Boilermakers..	" " " " "
Helpers..	" " " " "
All foremen..	Charged through indirect cost.
Planers..	" " " " "
Labourers..	Actual wages paid plus indirect cost.
Shop foremen..	Charged through indirect cost.
Pattern makers..	Actual wages paid plus indirect cost.
Cementers..	" " " " "
Painters..	" " " " "
Machinist and lathe..	" " " " "
Machinist and drill..	" " " " "
Machinist and radial drill..	" " " " "
Machinist and planer..	" " " " "
Lathe..	Charged through indirect cost.
Planer..	" " " " "
Foreman of punch shop..	Actual wages paid plus indirect cost.
Operator of punch and shears..	" " " " "
Operator at pipe cutting machine..	" " " " "
Operator at counter sinking machine..	" " " " "
Operator at steam rolls..	" " " " "
Operator at bolt cutting machine..	" " " " "

SCHEDULE OF PRICES TO BE CHARGED TO HAULING OUT VESSELS AT GOVERNMENT SHIPYARD, QUEBEC.

Dredging Fleet.	1st Day.		Following.
Tugs under 80 ft.	\$ 10 00	\$ 3 00	
Tugs 80 to 110 ft.	15 00	3 00	
Tugs over 110 ft.	20 00	3 00	
Scows—Dump, sounding, machine, &c.	15 00	3 00	
Stone lifters, coal barges.	20 00	3 00	
Lodging scows.	10 00	3 00	
Private Boats.			
Tugs under 80 ft.	20 00	5 00	
Tugs 80 to 110 ft.	30 00	5 00	
Tugs over 110 ft.	40 00	5 00	
Scows—small.	15 00	5 00	
Scows—large.	25 00	5 00	
Dredges.	40 00	5 00	
Acetylene.	30 00	5 00	

DAILY WORKING EXPENSES OF THE YARD.

	Per Month.
General staff, director, &c..... (4)	\$ 716 66
Office staff..... (6)	351 10
Stores..... (12)	688 30
Cost department..... (6)	355 00
General (watchmen, &c.)..... (14)	588 90
Foremen..... (12)	1,181 22
Drawing office staff..... (11)	909 02
Coal used per year is 1,200 tons at \$4.10, plus 30c. for cartage—equals \$4.40.....	\$52 80+12
Electricity 650 H.P. at \$36.50 \$20070+12.....	1,673 00
Rent.....	100 00
Horse feed, oil, belts, repair to tools and up-keep of plant—say.....	250 00
	\$ 7,263 20
Per working day.....	279 35

STEEL TWINSCREW STEAMER No. 21 'MONTMAGNY,' BUILT AT SOREL FOR LIGHTHOUSE SERVICE BELOW QUEBEC.

SPECIFICATION.

Length between perpendiculars.....	212 ft. - 8 in.
Length over all.....	222 ft. - 0 in.
Beam moulded.....	34 ft. - 8 in.
Depth moulded to upper deck.....	22 ft. - 0 in.
Draught of water (loaded) mean.....	15 ft. - 0 in.
Displacement to L.W.L.....	2,080 tons.
Cargo at load draught.....	600 tons.
Coal at load draught.....	230 "
Reserve feed tank at load draught.....	25 "
Fresh water tank at load draught.....	10 "
Total deadweight.....	865 "
Capacity of fore peak tank.....	13 "
Capacity of after peak tank.....	45 "
Capacity of double bottom.....	120 "
Capacity of trimming tank.....	85 "
Speed.....	11½ knots.

The vessel is built of steel and is of the flush deck type with two pole masts. There are three steel decks; the upper deck sheathed with wood throughout, the main and lower decks sheathed with wood only in the way of accommodation. There is a boat deck in way of the deck houses. There is a double bottom 3 feet deep extending through machinery space and bunker divided into three watertight compartments, that under the boilers forming the reserve feed tank. There are six watertight bulkheads. The whole of the steel scantlings are not less than required for Lloyds highest class. The accommodation for the officials is placed aft and consists of two storerooms, an office and bath room in a deck house, and a dining saloon, two two-berth cabins, two four-berth cabins, pantry and bath room, also baggage and linen rooms on the main deck.

Accommodation for captain, chief mate, chief engineer, 2nd and 3rd mates, wireless operator, with mess room and bath room, also the galley, is placed in the deck house amidships. Accommodation for 2nd and 3rd engineers, three two-berth and one

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four-berth cabins are on the main deck amidships where are also placed the ice house, two provision storerooms, boatswain's store, paint locker, lamp room and workshop, which is fitted up with lathe, shaper, drilling machine, &c., driven by an electric motor. The accommodation for four oilers, four quartermasters, boatswain, carpenter, two cooks; mess room, bath room and carpenter's store is arranged on main deck forward and on the same deck just aft of this is accommodation for 12 sailors and 12 firemen. The lower deck below the petty officer's quarters is arranged as store room. Temporary accommodation for 20 men with pantry and lavatories is arranged at the after end of forehold on the main deck. The two lower masts are of steel to the hounds with pitch pin top masts. The 7 in. x 10 in. steam winch for the forehold is arranged with suitable derrick and gear for lifting 12 tons with a purchase of two double blocks or 3½ tons direct from the barrel. The 5 in. x 10 in. after winch will lift 2 tons direct from the barrel. There is a steam and hand windlass for lifting the anchors (30½ cwt. each with 1½ in. cable) a 6 in. x 8 in. boat hoisting winch is fitted on the bridge deck amidship. The boats include 2 life boats, 3 surf boats, 1 gasoline launch. The 4 latter have Welin patent davits. On the boat deck which extends the length of the midship deck house is a wheel house and chart room with a navigating bridge on top. The steam steering engine is placed in the engine casing with one wheel on the bridge and one in the wheel house, there is also screw-hand gear aft. The vessel is lighted throughout with electric light, including signal lanterns and is fitted with wireless telegraph.

The machinery consists of twin screw triple expansion engines, having cylinders 16 in., 24 in. and 39 in. diameter by 24 in. stroke supplied with steam from 2 boilers of marine return tube type 14 ft. 0 in. diameter by 10 ft. 0 in. long, each having three furnaces, 3 ft. 3 in. diameter and 272 3-in. tubes, the working pressure, 180 lbs. per sq. in.

There is a donkey boiler of the vertical type 5 ft. 0 in. diameter by 9 ft. 2 in. high, working pressure 125 lbs.

The auxiliaries include 'Weir's' feed pump, ballast pump, general service and fire pump, feed heater, sanitary and fresh water pumps, also ash ejector.

A navy type hand pump is placed in the casing and connected to the general service pump suction box for use when steam is not available.

Particulars of Main Boiler—

Inside diameter, 14 ft.

Length, 10 ft.

Shell 1½ in. thick. Two plates in circumference, one plate in length. 1½ in. rivets in longitudinal and circumference joints.

Three corrugated furnaces, 39 in. inside diam, and 1½ in. thick. Make 'Brown's' cambered. The above furnaces have withdrawable ends.

178 plain tubes, 3 in. ext. diam. 6 ft. 9½ in. long x 8 I.W.G. thick.

42 ordinary stay tubes ½-inch. thick.

52 boundary stay tubes, ¾-in. thick.

In all 272 tubes 6 ft. 9½ in. long x 3 in. ext. diam.

Total heating surface for one boiler, = 1,731 sq. ft.

Total grate area for one boiler, = 58½ sq. ft.

Patent shaking grates 6 ft. long.

Weight of one boiler (bare, without mountings), 35 tons.

Working pressure: 170 lbs. per square inch.

Test pressure: Hyd. 255 lbs. per square inch.

Boiler Mountings—

One 3-in. double spring safety valve.

One main steam stop valve, 4½-in. bore.

One aux. steam stop valve, 3½-in. bore.

One steam to whistle, 2-in. bore. Starboard boiler only.

Boiler Mountings—Continued.

- One bottom blow-off cock, 2-in. bore.
- One surface blow-off valve, 1½-in. bore.
- Two feed check valves, 2-in. bore.
- One water gauge with 1½-in. connections.
- Three test cocks, one salinometer cock.
- One cock for pressure gauge connections.
- One diamond tube blower and connections, fitted for each nest of tubes.

Auxiliaries—

- Two vertical feed pumps, 'Weir's' make. Size 8-in. x 6-in. x 18-in. simplex.
- One ballast pump, vertical duplex. Size 7½-in. x 10½-in., x 10-in. 'Blake,' John McDougal, Montreal.
- One general service pump, vertical duplex, 8-in. x 6-in. x 11-in. 'Drolet,' Quebec.
- Two sanitary pumps, vertical simplex, 6-in. x 4-in. x 8-in., 'Blake,' John McDougal, Montreal.
- One Donkey boiler feed pump, vertical simplex, 4½-in. x 3-in. x 6-in. 'Blake,' John McDougal, Montreal.
- One 25 K.W. engine and dynamo, 'Robb Armstrong.' (200 lights all told. The search-light was supplied at Quebec).
- One Contact feed heater, 'Weir's' make.
- One feed water filter, Blackburn Smith, New York.
- One See's ash ejector, Mechan's, Glasgow.
- One steering engine, 6-in. x 8-in. 'Caldwell,' Glasgow.

Piping—

- Steam and exhaust pipes—copper.
- Winch pipes—copper.
- Bilge pipes—lead.
- Ballast pipes—cast iron, copper bends.
- Dock water service—iron.
- Water service to baths, &c.—galvanized iron.
- Heating system to cabins, &c.—iron.

Donkey Boiler—

- Type; vertical. Made in Sorel shipyard.
- Size: 5 ft. diam. Height, 9 ft. 2 in.
- Shell ½-in. thick, 2 plates in height, and one plate circumference.
- Rivetting, ⅜-in. throughout.
- Working pressure: 125 lbs. per square inch.
- Test pressure: Hyd. 188 lbs. per square inch.
- Tubes: 184 plain vertical tubes 2-in. ext. diam. x 9 I.W.G. thick.
- 24 stay tubes, 2-in. ext. diam. x ¼-in. thick.
- In all 208 tubes 3 ft. 3 in. long.
- Total heating surface, 388 square feet.
- Grate area, 14 square feet.
- Ordinary grate bars (circular).
- Weight (estimated), bare boiler, 3½ tons.

Donkey Boiler Mountings—

- One 2-in. double spring safety valve.
- One 2½-in. steam stop valve.
- Two 1½-in. feed check valves.
- One 1½-in. blow-off cock.
- One 1-in. surface blow-off valve.
- One water gauge, direct on shell.
- Three test cocks.

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Main Engine, Twin Screw—

Three cylinder 16-in. - 24-in. - 30-in. inverted triple expansion surface condensing
24-in.
engines.

Makers: Fleming & Ferguson, Paisley, Scotland.

Collective I.H.P. about 1,200. Revolutions: 140 about.

Piston valves for H.P. Ordinary slide valves for I.P. and L.P. cylinders.

Reversing engine (steam), of the direct acting type. Hand gear consists of large lever on end of wiper shaft.

Columns—

Cast iron. The three back columns and condenser are cast in one piece. Guide faces on both back and front columns.

Pumps—

Circulating air, feed and bilge pumps are attached to back of condenser and worked by levers on I.P. engine.

Turning Gear—

Hand worked by ratchet.

Crank Shaft—

7½-in. diam. long, 7 collars 14-in. diam.

Thrust Shaft—

7½-in. diam. x 5 ft. 4½ in.

The vessel was designed and model made 28th March, 1907.

The steel material was ordered 29th June, 1907.

The steel material began to come to hand February, 1908.

Building was commenced 18th May, 1908.

Keel laid, July, 1908.

Launched 4th September, 1909.

Trial trip 2nd July, 1910.

Delivered 3rd July, 1910.

Three years and three months to build.

The reason we hit upon comparing the cost of building this vessel with an estimate of what she ought to have cost was that the vessel was of recent build and of rather different type to the usual construction at the yard.

We had a great amount of trouble to get at actual cost and weights—records of any kind were in the negative. After persevering, we found they had kept the cost of this vessel and machinery under 113 separate numbers. It took the staff fully two weeks to get out these figures, and then they were found to be incorrect, the one being mixed up with the other. We could not get a specification or weights of steel used in construction; in fact, they had no data of any kind; we had to ferret it out for ourselves. We cross-examined the foreman carpenter as to various items charged up, such as—

Scaffolding, \$5,522.61—of this amount about \$2,000 were charged against carpenters. Asked why carpenters were employed on this work (which is really labourers' work) he replied it was usual to have carpenters to do part of it. About \$2,000 was charged against material and the remainder for labourers, &c.

This whole charge is excessive and a rebate should have been arranged as most of the wood used will answer again for other vessels under construction.

The screeve board cost \$312, which is out of all character; the wood used should have been credited to the ship and used again; instead of that it was taken to make shelters for the men, and that was the end of it, and this ship had to pay for it.

Wooden foundations—which means keel blocks, &c., cost \$3,193.38—\$1,808 of this is for wood which should be used again for the same purpose.

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Launching ways, amounting to \$4,430.83, of which \$2,316.85 was charged for wood, &c.; the same remark applies here. The launching operation cost \$6,511.73; a most extraordinary amount of money to launch a boat of the size.

The engine room skylight cost.	\$1,265 66
Asbestos boiler covering cost.	1,398 36
Fire hold and engine room grating cost.	1,618 87
Accommodation ladder.	627 96

All these amounts are grossly in excess of what they ought to be. The iron work cost we were most anxious to find out but it is an utter impossibility.

The moulding loft work on this vessel cost \$12,000, nearly \$9,000 for labour, which is an excessive charge and shows that this department is not handled properly. In fact, the whole carpenter department wants to be rooted out and reorganized.

The oakum is bought unspun and two men kept all the year around to spin it by hand in a shelter. Machine-spun oakum can be bought very much cheaper. Our estimate is liberal and it shows that a loss of 29½ per cent was made on the hull and equipment.

WEIGHT OF HULL DISPLACEMENT, D. W., ETC.—No. 21 C.G.S. 'MONTMAGNY.'

		Material charged in stock book.	Net material as calculated.
Steel plates.	428		
" angles and shapes.	214		
" rivets.		642 35	500 8 (heads only.)
Structural Forgings—			
Stern, &c.	No. 2,690		
Rudder stock.	" 1,460		
Pillars, &c.	" 15,652		
Blacksmith's work—		6½	6½
Handrails and stanchions.	" 8,748		
Boat davits.	" 11,778		
E. R. Stokehold gratings.	" 7,135		
Mastwork, &c.	" 8,179		
Iron and Metal Castings—		16	13
Hawee pipes.	" 4,935		
Bollards.	" 5,694		
Steering blocks, &c.	" 1,926		
Chain pipes and stoppins.	" 3,383		
Tunnel door.	" 1,347		
Sundries.	" 9,395		
Carpenters woodwork, hold ceiling, bunker flat, decks, handrails, masts, &c.		12	11½
Woodwork joiners, chart house, cabin work, &c.		68	56
Cement and sand.		71	35
Paint, 6 tons, oil and turps., 2 tons.		47	47
Anchor and chains.		8	8
Deck machinery—		24	24
3 winches, 1 windlass.			
Outfit including 4 pairs of Welin davits, rigging, boats, heating, plumbing, ventilation, galley, upholstering, machine shop, wire and manilla ropes, compasses, telegraph, steering gear, outfit, etc.		11½	11½
Machinery—		164½	164½
Engines.	Tons. 54½		
Boilers.	" 86		
Water in boilers.	" 40		
Pumps, fittings, auxiliaries, pipes, shafting and propellers.	" 46½		
Donkey boiler.	" 4		
Equipped weight of hull.			230
(Coal cargo) deadweight.			1 215 865
Displacement at 15' mean draft.		Tons.	2,080

SESSIONAL PAPER No. 57

No. 21—'MONTMAGNY,' TIMBER CHARGED.

Board Measure.		Approximate weight in long tons.
Spruce	45,040 at 26 lbs. per cubic feet.....	43.3
W. Pine	94,811 at 24 " "	84.6
R. "	51,565 at 28 " "	49.2
P. "	4,402 at 40 " "	5.5
B. C. Fir	1,550 at 38 " "	2.2
Hemlock	11,427 at 25 " "	10.6
Elm	27,541 at 35 " "	36.0
Teak	8,460 at 50 " "	15.8
Oak	770 at 45 " "	1.3
Cottonwood	410 at 32 " "	0.5
Birch	184 at 33 " "	0.2
Total.. 246,180 ft.		250.2
Weight charged to scaffolding, foundations, ways and launching. 95.2		95.2
Charged to vessel.....		155.0
Calculated weight of timber in vessel.....		91.0
Excess.....		64.0

	Board measure.
	Fect.
Board measure issued.....	246,180
" used for scaffolding, foundations, ways, launching.....	102,822
" approx. as calculated.....	143,858
Excess.....	86,860
	56,998

Job Nos.	Machine.	Blacksmith.	Boiler.	Pattern.	Pipe.	Paint.	Yardmen and Tanners.	Electrical.	Mould Loft.	Drafting.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
C 183		2 66								3,937 44
393				16 65					29 35	
402	7 81	27 13					Y 1,148 92			
421	486 93	498 97	3,223 44		0 41	54 25	T 22 11			
472							94 09		3 76	174 75
480		2 72				0 39	10 88		215 06	
484	11 76	30 10	3,553 78		15 29		85 93		65 44	
485									19 13	
501	2 69	74 21					16 50			6 85
502	200 45	35 59	271 06	258 23			92 39	13 06	50 59	52 00
503	210 15	150 44	45 95	55 07			115 21		1 83	16 35
504				191 66						50 00
520	6 02	61 64	14,665 54	70 40			478 45		2,237 37	
521	8 94	27 95	5,083 73	0 56			59 41		589 12	112 73
522		13 65	1,147 93				19 62		153 35	41 87
524	483 14	69 45		39 83			290 05			104 90
532	314 05	46 07	2 20	252 77	2,405 89		10 93			1,643 08
533	371 19	34 67	10 63	77 57	661 96		5 05			1,483 39
561	41 62	1 10	60 20	4 39			27 56			6 50
562	4 35	20 13					91 36		29 07	
569	6 46	67 39	83 82				41 49		3 08	
589			29 46		1 22		425 48			
589	41 06	25 32	1,145 47	37 40			15 19		77 82	29 44
590	160 64			64 75			7 97			50 38
611	382 36	73 25	7,899 45	6 40			349 22		1,498 76	
612		80 04	5,893 29				250 66		1,195 16	
613	33 11	494 34	100 42	1 74	323 11		64 44		298 27	
617	3 12	32 09	4,587 47				3 15			
618			2,144 87							
634	73 74	12 40					697 86			
642		1 43					376 36			
655										36 14
656	1 10	16 56	33 41			9 60	4 94		3 50	47 78
667		1 27	51 22	11 43	40 70					
668		0 70	2 55							
683							450 07			
694	69 31	55 02	434 25	65 54			7 60	460 06	21 25	
695	0 90	61 43	583 71				47 42		63 61	52 88
697		418 90	648 42				5 33		56 32	
704	0 94	3 13	38 03			8 80	14 48		22 52	38 47
739	1 81	10 24	25 21	24 52			63 18			
740			298 69				18 85		57 77	
741	0 36	1 58	299 97				70 20		45 43	
743		0 79	214 87				3 17		44 52	
744		0 79	367 36		0 46	210 12	72 24		172 97	
745			1,009 83				41 96		216 03	
746	8 53	12 11	1,431 03				54 38		392 45	
763										
773	69 08			16 00			3 78			
774		3 78	522 81	3 94			6 70		7 43	13 00
782	54 25			301 36			9 30			30 95
786	0 46	1 85	337 24		1 50		30 07		13 25	
787	7 59	54 16	1,228 64		4 33	18 60	68 69		186 97	
788	17 06	48 98	433 83				35 45		76 00	
801	32 19	31 60		8 92	1,115 20		3 47			7 82
802	87 90	1 71		50 42			49 18			9 53
804	70 55			98 88			1 88			35 41
813				11 00			4 83			
823		0 70				5,717 94				

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DIRECT COST.

Asbestos.	Carpenter.	Cabinet, Caulkers and Sawmill.	Total Direct.	Indirect.	Material.	Grand Total.	
\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	
	4 50	o 11 25	3,961 82	1,669 32	5 97	5,637 11	Plan.
		o 0 80	46 80	29 58	20 13	96 51	Wooden model.
	1,575 91	s 59 56	2,819 38	783 86	1,919 39	5,522 61	Scaffolding.
		s 4 68	6,513 89	3,965 15	6,135 09	16,513 63	Two boilers.
			215 06	106 56	21 25	342 87	Full size outlining.
	13 55	3 13	96 11	41 81	174 28	312 20	Serieve board.
1,367 33	803 84	s 127 63	6,014 79	2,488 96	6,645 59	15,149 34	Hull.
					1,786 71	1,786 71	Anchor, wires and chains.
	7 00		106 65	90 26	380 23	577 14	Storn frame.
	11 38	s 73 04	1,057 79	566 06	1,402 41	3,026 28	Storn tubes and brackets.
			595 00	266 04	451 22	1,312 26	Rudder pintles and quadrant.
			241 66	172 36	92 94	506 56	Cast steel connective to stern and sternpost.
	254 83	s 23 10	17,837 85	10,967 87	12,691 66	41,496 88	Hull framing (includes steel ship
			5,882 47	3,149 94	2,476 94	11,509 35	Bulkheads. (in frame).
			1,379 32	738 89	434 28	2,552 49	Engine and boiler foundations.
	14 60	c 2 88	1,018 75	367 62	3,837 29	5,223 66	2 sets propeller shafts & bearings.
	9 60	s 1 90	4,586 49	1,464 88	6,113 79	12,463 16	Steam piping arrangement.
	80 27	s 1 68	1,391 41	573 33	1,562 30	3,926 69	Bilge and ballast.
			141 37	61 27	441 83	544 47	Ash ejector.
	945 96	s 19 74	1,110 51	274 44	1,808 77	3,193 82	Wooden foundations.
			195 15	113 62	142 43	455 20	Forged stem.
3 10			460 26	109 80	17,753 00	18,322 76	Propelling machinery includes Fleming & Ferguson's contract
			1,371 70	798 27	479 25	2,649 22	Donkey boiler.
			283 74	141 65	256 94	682 33	Thrust blocks.
	37 71	o 66 23	10,253 88	5,659 68	8,625 24	24,738 30	Shell plating without riveting.
		s 0 88	7,430 03	4,004 32	6,486 10	17,930 08	Deck plating.
			1,243 43	647 68	1,422 22	3,513 33	Bulwark.
		s 1 67	4,627 50	2,443 20	911 90	7,982 60	Shell plating riveting only.
		s 0 80	2,145 67	1,034 82	496 75	3,676 24	Deck plating riveting.
	194 84	k 751 06	1,734 90	385 06	2,316 85	4,436 83	Ways.
			377 79	95 52	25 71	499 02	Erection of boilers.
			36 14	15 61	294 00	345 75	1/2 propellers.
	491 22	o 337 33	995 44	560 99	756 43	2,312 86	Chart house.
	10 40	c 474 81	589 83	282 90	563 49	1,436 22	Deck house, sash & doors in teak.
			453 32	181 18	7 13	641 63	Snow cleaning.
	7 07		473 13	200 01	76 04	749 18	Temporary light.
			652 97	335 31	352 44	1,340 72	Boiler equipment.
28 56			838 54	419 99	316 12	1,574 65	Smoke box.
			1,128 97	620 04	489 07	2,238 08	Arrangement of pillars.
			126 37	62 39	207 32	396 08	Funnel and damper.
	76 50		201 46	83 95	271 71	557 12	Moving arrangement.
	10 80		336 11	193 69	335 90	915 70	Engine and boiler casing.
		o 1 24	418 88	186 30	153 31	758 49	2 tanks in tunnel.
	47 55		310 90	152 63	190 32	608 55	Coal chutes.
	798 39	o 168 69	1,791 01	691 78	1,440 57	3,923 86	Officers quarters between deck aft
	371 94	o 185 96	1,825 72	840 22	1,398 81	4,064 75	" " upper deck.
	28 47	c 48 24	1,976 01	1,073 78	1,792 28	4,842 07	Main upper deck house.
			1 50	0 99		2 49	2 blow-off cocks (Do. 2222).
	1 35		82 96	33 13	40 53	156 67	2 sea suction valves 2 box.
			557 66	271 88	116 35	944 89	Upper deck.
	1 35		397 21	252 75	154 26	774 23	Circulating pump sea suction
	495 13	k 190 80	4,070 30	442 79	1,072 12	2,585 21	Lower deck. [valve.
	938 37	k 334 78	2,843 11	1,317 95	2,568 50	6,738 56	Bridge deck and stanchion.
	1,236 15	k 397 07	2,244 62	853 46	2,061 40	5,239 48	Main deck.
	23 60		1,222 80	376 85	1,800 68	3,400 33	Sanitary pumps and piping.
		o 3 40	201 14	89 03	2,548 20	2,838 37	Feed " "
			206 72	129 36	924 59	1,260 67	Ballast " "
			17 18	8 26	159 63	185 06	Ventilating system.
			5,718 64	1,301 47	1,303 47	8,323 58	Painting inside and outside of hull.

3 GEORGE V., A. 1918

COST OF No. 21—

Job No.	Machine.	Blacksmith.	Boiler.	Pattern	Pipe.	Paint.	Yardmen and Teamsters.	Electrical.	Mould Lost.	Drafting.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	cts.
C 831	12 15	2 43	8 75				265 07	688 45	36 51	16 16
836	24 75	12 17	81 35	320 18			12 56			20 83
847	106 36	9 59		48 85			1 38			100 27
849	57 20	26 78	2 10	142 18	823 04	121 99	14 50			7 69
860							1,384 25			
869			51 82							
872	1 26	28 00	868 73			2 82	120 99		107 92	8 33
883	0 80	2 19					3 78			
884	2,681 44	112 26	2 83	5 45	1 66		53 06		29 54	
900	2 38	0 35					3 64			
918	6 07	15 72	34 07				362 14			114 19
924	0 84			6 46						
926	9 99						8 92			
927	41 40									
943		1 63			55 58		68 12		5 03	
944		0 44					12 57			
945	11 76		3 85	12 95			0 84			
949	2 24	4 94	459 86				39 27		22 40	
950	169 35	49 70	357 77	18 87		1 70	7 85		26 02	
953		3 28					16 66			
954	1 51	8 04					17 78			
967	65 96	5 05	125 82			1 70			7 87	
972	1 75	20 76	492 31		1 73		8 56		36 32	
988	34 07	92 39	614 75	9 93	34 01				14 90	
1012	20 10	5 52	16 16		7 94					
1034							5 79			
1044	302 94	54 69	369 94	29 72			53 81		62 10	
1050	19 63	1 55		61 88	67 00					
1061	78 73	167 25	605 77				2 78		110 15	
1067	175 69					18 75	17 49			
1071	0 50	0 75	20 60				35 13			
1091							24 32			
1098					56 20		2 84			
1105	132 15	526 06	59 49	7 06			44 75			
1109	11 49									
1126	7 30		30 84		41 61		2 75			
1142	24 54	169 38	13 95	7 59			104 90			
1144			4 05				2 44			
1146	1 97	11 35			550 53					
1149	5 45	0 78	93 24		6 68		130 16			
1151	15 39	2 50	539 06		1 75		27 04		128 08	
1152		15 11	27 59		42 83		15 61		6 68	
1158	0 90	1 83	333 04				13 42		70 28	
1177	2 31		38 69				14 66			
1181	16 24	2 90		10 00			41 15			
1193	1 13	27 27								
1210		58 72					1 67			
1244	6 46	2 45		12 00		4 38	90 33			
1264							63 11			
1284	33 48	140 17	12 35	17 33			14 67			
1286										
1289	1 60		50 25					6 30		
1293		14 75	52 76				1 40			
1305	19 62		5 41							

SOREL SHIPYARD

SESSIONAL PAPER No. 57

DIRECT COST—Concluded.

Asbestos	Carpenter.	Cabinet Caulkers and Sawmill.	Total Direct.	Indirect.	Material.	Grand Total.	
\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	
	130 35		1,159 87	332 77	1,111 52	2,604 16	Lighting system.
	29 62		561 45	328 73	212 13	1,042 31	Hawse pipes and chain stopper.
			265 45	112 12	89 48	467 05	Watertight door to funnel.
	162 25		1,357 73	586 69	962 32	2,906 74	Drainage system.
			1,384 25	250 20	6 21	1,640 66	Cleaning and sweeping.
			51 82	26 75	0 48	79 06	Auxiliary engine.
	152 79	s 2 74	1,299 58	623 44	531 25	2,454 27	2 steel masts (dx).
	85 08	s 1 90	93 75	37 01	35 43	216 79	Funnel.
	369 91	c 31 38	3,287 53	1,228 23	1,097 63	5,613 39	Erection of machinery.
			6 37	1 73	430 73	433 83	Filter (Blackburn & Smith).
	402 65	c 210 25	1,145 07	416 12	513 71	2,074 90	Launching operations.
		s 15	7 30	5 86	4 09	67 25	12 brass wriggles (Dr. No. 2193).
			22 06	7 02	499 50	528 58	Feed water heater.
			41 40	15 24	106 72	16 36	Main circulating outlet (Dr. No. 2181).
	716 22	k 350 16	1,196 74	414 75	1,327 00	2,938 49	Lower deck crew quarters.
	933 24	k 392 02	1,338 27	476 16	779 82	2,654 25	Petty officers quarters.
			29 40	18 64	49 86	97 90	2 only 14-in. check valves.
			528 71	251 28	201 21	981 20	Main funnel casing.
			622 26	290 92	352 48	1,265 66	Engine room skylight (steel).
	72 01	s 8 40	99 35	40 73	91 32	231 40	Stern hatchee.
	205 96	s 13 65	246 94	95 98	199 41	542 33	Main "
			206 40	88 32	93 74	388 46	Galley skylight (steel).
			561 43	272 69	233 48	1,067 60	Ventilators Coamings (Dr. No. 21109).
	24 65	k 37 93	862 63	337 02	1,936 02	3,135 67	Engine room and fire hold equip.
			49 72	19 71	307 88	377 31	Donkey boiler equipment. (Inent.
	779 15		784 94	225 75	387 67	1,398 36	Asbestos boiler coverings.
	286 35	s 10 30	1,139 46	466 98	2,179 87	3,786 31	Steering arrangement.
	1 00		151 06	81 60	347 69	580 35	Awning stanchions upper bridge.
			964 68	442 50	211 19	1,618 37	Fire hold and engine room grat.
	39 70	c 3 40	215 33	70 73	32 21	318 27	Gasoline launch. (Ings.
			96 68	34 60	891 47	1,022 75	Windlass.
		s 3 50	27 82	6 23	59 50	93 55	Booming, winter, '09-'10.
			59 04	22 89	282 56	364 42	Galley equipment.
	556 45		1,325 90	716 80	2,971 87	5,014 63	Masts, riggings.
			11 49	4 09	7 12	22 70	Ash hoisting gear.
	310 78	c 21 43	444 71	139 84	453 05	1,043 50	Engin'g's telegraph.
	140 27		451 63	181 73	696 32	1,329 74	Boat davits and gear.
	30 50	c 7 05	44 04	14 01	418 28	476 33	Official mess room equipment.
			563 85	146 27	524 58	1,234 70	Steam heating.
		k 56 00	292 31	96 83	315 62	734 76	Deck equip. (Tarpaulin covers and awnings).
	62 05	t 19 50	795 37	328 00	418 03	1,541 40	Engine room and fire hold floors.
	119 78		239 51	71 83	277 92	580 16	Refrigerator.
			427 55	174 02	290 68	892 25	Main deck W. O. for crew.
		k 3 50	109 16	33 63	830 39	973 18	Machine shop equipment.
			67 29	20 84	22 21	110 34	Anchor crane.
	46 67		38 40	22 43	8 52	69 36	Ring and eye bolts.
	568 37	c 63 81	107 06	49 96	27 70	184 72	Boat boom.
			741 80	240 28	1,208 67	2,190 75	Crew quarters equipment
			53 11	10 54	90 00	153 65	Coaling.
	59 85		263 83	138 82	220 29	627 96	Accommodation ladders (Dr. No. 21180).
			6 30	1 40		7 70	Wireless telegraph.
			60 85	22 55	316 53	399 93	Diamond jet blowers.
			68 91	29 61	40 06	138 58	Reels for hawsers (Dr. No. 15156-15157).
			25 03	8 69	5 04	38 76	Brass name "Montmagny."
			137,907 06	64,655 16	134,130 02	336,692 24	(Wireless was not fitted at Sorel).
			Machinery			\$ 89,593 00	
			Hull			247,099 00	
			Grand total			\$ 336,692 00	

SOREL SHIPYARD

SESSIONAL PAPER No. 57

SUMMARY.

Hull.....	\$ 245,687 00
Machinery.....	63,454 00
Boilers.....	27,511 00
Grand total.....	<u>\$ 336,692 00</u>

APPROPRIATIONS WERE GRANTED:

1907-8.....	\$ 12,260 28
1908-9.....	166,134 71
1909-10.....	128,274 14
1910-11.....	42,981 53
Total.....	<u>\$ 339,650 66</u>

ESTIMATE OF PROPER COST OF SHIP No. 21.

Steel plates and shapes, nett long tons, Wm. B.....	600	
Add 7½ p.c. scrap " " "	45	
		645-722 short tons say 730.

<i>Material.</i>	<i>Labour.</i>		
750 at \$37.00.....	27,910 at 2½.....	36,500.....	\$ 63,510 00
Riv. 5 p.c. 37 at 65.00.....	4,057 at 12c.....	8,880.....	10,937 00
			<u>\$ 74,447 00</u>
C.S. Steam, post, rudder and brackets.....			1,500 00
Castings, steel and iron.....			1,800 00
Joiner work.....			10,000 00
Carpenter work.....			9,000 00
Blacksmith work.....			2,200 00
Painting.....			4,000 00
Cementing.....			750 00
Cleaning up.....			450 00
Moulds.....			4,500 00
False work.....			1,200 00
Launch.....			1,000 00
Ballast piping and pumps (in machinery).....			
Steam heating.....			1,600 00
Plumbing.....			2,400 00
Telegraphs.....			600 00
Electric Light.....			3,500 00
Windlass.....			650 00
Steering gear, includes hand.....			1,600 00
Anchors and chains.....			1,600 00
Hawsers, warps, nippers, &c.....			800 00
Fire and life appliance.....			100 00
Tiling.....			200 00
Upholstering.....			1,000 00
Wire rigging.....			350 00
Derrick gear blocks, &c.....			500 00
Spars.....			200 00
W. T. door.....			300 00
Boats (say 4 boats).....			1,500 00
Hoisting winch for boats.....			400 00
2 winches.....			1,600 00
Ventilator.....			200 00
Outfit flags, bell, &c.....			300 00
Lamps, signal and berth.....			450 00
Sidelights—60.....			1,300 00
Galley range and utensils.....			350 00
Insulation.....			500 00
Awnings and covers.....			550 00
Compasses.....			700 00
Chandelier and deck stores.....			400 00
Bedding and linen.....			1,600 00
Æ Plate.....			500 00

ESTIMATE OF PROPER COST OF SHIP No. 21—Continued.

Galvanizing.....	\$	100 00
Welding davits (2 sets).....		750 00
Sundries.....		2,000 00
	\$	139,347 00
Maintenance—20 p.c.....		27,869 00
	\$	167,216 00
Machinery.....		65,000 00
	\$	232,216 00
Say.....		240,000 00
Cost.....	336,692 00	
Estimated proper cost.....	240,000 00	
Difference.....	\$	96,692 00=29 p.c.

ESTIMATED COST OF MACHINERY AND BOILERS.

15x21x39		
(2) 21 Inverted triple expansion surface condensing engines; collective 1 h.p., 1,200; revs., 140; steam reversing gear, columns cast iron, propellers solid c. iron, 8 ft. 0 in. dia. x 9-3 pitch. \$12,000 each.....	\$	24,000 00
(2) Boilers, Scotch, 14 ft. 0 in. dia. x 10 ft. 0 in. long, 3 corr. furnaces 39 in. dia., 178 tubes 3 in. x 6 ft. 9½ in. U.S. 1731, G.S. 581, working pressure 170 lbs., \$5,300 each.....		10,600 00
(2) Vert. feed pumps, Weirs 8 x 6 x 18 Simplex.....		1,500 00
(1) Ballast pump vert. duplex 7½ x 10½ x 10 Blake.....		400 00
(1) General service donkey vert. duplex 8 x 6 x 11 'Blake'.....		450 00
(2) Sanitary pumps vert. simplex 6 x 4 x 8 'Blake'.....		600 00
(1) Donkey boiler feed pump simplex 4½ x 3 x 6 'Blake'.....		300 00
(1) Contact feed heater "Weir".....		600 00
(1) Feed water filter, "Blackburn Smith," New York.....		400 00
(1) Lees ash ejector.....		750 00
Piping to winches, bilges, ballast, deck service, &c.....		7,500 00
Donkey boiler, vertical 9 ft. 2 in., 5 ft. 6 in. dia.....		1,600 00
Sundries.....		1,500 00
	\$50,200 00	
Maintenance 20%.....		10,040 00
Say.....	\$50,240 00	
	\$65,000 00	
Contract price, plates and angles, \$1.85 per 100 lbs.		
" " rivets.....	\$2.78	
" " C. S. sternpost.....	.6	cents per lb.
" " C. S. brackets.....	.6	"
" " C. S. stern shoes.....	.6	"
" " C. S. rudder.....	.6	"
" " Fleming and Ferguson main engines, £3,050.		In the rough.
Cost of Engines complete (including all charges).....	\$67,174 71	
" Boilers.....	26,250 12	

AUXILIARIES—

"Weir's" feed pump.....	\$	1,482 00
Ballast pump.....		368 00
General service pump.....		350 00
Sanitary and fresh water pump.....		296 00
"Weir's" feed heater..... (each)		475 00
Feed filter.....		410 00
Ash ejector.....		383 86
Steam steering engine.....		1,065 00
Hand steering gear with duty.....		117 01
Stone navy pump.....		133 12
7 x 10 winch.....		425 83
5 x 10 ".....		270 46
6 x 8 ".....		242 00
Duty on last two.....		76 80
Windlass.....		725 00
Drilling machine, emery grinder, lathe, shaper and 5 h.p. motor.....		712 50

Attached { General Arrangement Plan.
Longitudinal Section.
Midship Section.
Fleming & Ferguson's Specification of Main Engines.

SESSIONAL PAPER No. 57

ELEVATOR DREDGES Nos. 26, 27—NON-PROPELLING—BUILDING AT SOREL FOR USE IN THE ST. LAWRENCE SHIP CHANNEL.

SPECIFICATION.

Length B.P.	180 ft. - 0 in.
Breadth moulded.	40 ft. - 0 in.
Depth moulded.	14 ft. - 6 in.
Draft loaded (mean).	9 ft. - 0 in.
Deadweight at load draft.	197 long tons.
Dredging depth extreme at the load draft.	52 ft. - 0 in.

The vessels are built of steel, the scantlings being nowhere less than Lloyds requirements for their highest class and increased where necessary to withstand the strain of dredging. There are five watertight bulkheads and two non-watertight. The only W.T. bulkhead with an opening is between the engine and boiler room and a watertight door is fitted each side of the ship worked from the upper deck. There is a complete steel upper deck covered with 2½-in. pitch pine forward and aft, the plating being chequered elsewhere. There is a shelter deck at each end carried on stanchions; the mess room and accommodation for the junior officers and engineers, petty officers, cooks, refrigerators, pantry and galley are in deck house on the forward part of this deck and the cabins of the captain, chief engineer and chief second officers and a bath room are on the after part. The crew's quarters are on the port side below the upper deck at the forward end of well; there is accommodation for watchman, 2 oilers, 4 winchmen, 4 firemen and 6 sailors, also a storeroom.

The dredging engine is placed on the back of the main framing which is the after end of the vessel and built in a very substantial manner of steel plates and angles and carried by columns of semi-box form which are carried down to the top of the floors and connected to two of the bulkheads and to an extension of the well plating. There is one shoot which is placed on the port side and has a hinged part extending 14 feet over the side of the vessel and discharging 6 feet above the L.V.L.

The dredging engines are compound, having cylinders 17 in. x 34 in. x 36 in. stroke. In the engine room at the after end of the vessel under the upper deck, the auxiliaries consisting of a Weir's feed pump, Weir's feed heater, general service pump, shoot pump, sanitary pump and feed filter. The stern winch and dynamo are also in this compartment.

The bucket ladder, which is built of plates and angles and weighs complete with the bucket chain about 150 tons, is suspended at its upper end on the main framing and is carried at the forward end by 5 sheave blocks and 2½-in. wire ropes from the 'A' frame, which is built of plates and angles carried on columns of semi-box form.

The buckets are of cast steel with 4 wrought iron cutting teeth having tool steel points; they are 43 in number and the capacity of each bucket is 15 cu. ft. The dredging speed is about 16 buckets per minute. The hoisting winch is driven by a double vertical engine having cylinders 10 in. x 12 in. and is capable of lifting the ladder at a speed of 7 feet per minute.

The bow cable winch is driven by a similar engine and is capable of pulling in the rope at a speed of 100 ft. per minute in the working conditions. The barrel is large enough to stow 2,000 feet of 1½ in. dia. wire rope, the weight of the bow anchor is 3,000 lbs.

The 2 breasting winches have double horizontal cylinders 8 in. x 12 in. stroke with 2 barrels working in opposite directions, each barrel stows 1,000 feet 1½ in. dia. wire rope and the weight of each anchor is 2,000 lbs. The stern winch, which has double horizontal cylinders 10-in. x 12-in. with barrel capable of stowing 1,500 feet 1½-in. dia. wire rope; the weight of the stern anchor is 2,000 lbs. Two steam capstans having cylinders 7-in. x 8-in. stroke are fitted on deck for manœuvring scows &c. A winch

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having cylinders 6 in. x 6 in. stroke is fitted for lifting the hinged shoot. The machinery is supplied with steam from two marine return tube boilers 12 ft. dia. x 10 ft. long, having a working pressure of 130 lbs. per sq. inch and working with natural draught; they are placed one on each side of the vessel just forward of the main framing. Each stokehold is fitted with a See's ash ejector. The bunkers are placed one on each side forward of the stokeholds, with large hatches on deck. A five tons hand derrick for lifting buckets is placed on the starboard side abreast of the ladder.

An electric generator with a complete installation of lamps, including a search-light, is fitted.

All the accommodation is steam heated and all the cabins on the shelter deck including bath room, W.C. and galley, are supplied with running water.

Main Engines (Dredging)—

One set compound jet condensing engines, connected direct to gear and attached to back of main framing (i.e. superstructure for carrying top gearing) above main deck.

Size: 17 in. — 34 in. working pressure 130 lbs. per square inch.

36-in.

Revolutions at a speed of 16 to 17 buckets per minute. (I.H.P. — 450).

Makers: Fleming & Ferguson, Paisley, Scotland.

There are no pumps worked by main engines.

Steam reversing engine — acting type.

Steam turning gear.

Front columns are forged steel.

No back columns, their place being taken by a long bed-plate to which the cylinders are bolted. The main bearings are cast on bed-plate.

Crank shaft: Built 8½-in. diameter.

Piston rod guides are of the locomotive type with single bar.

Governor—

A Pickering governor is supplied to prevent excessive speed.

Auxiliaries—

One feed pump, 'Weir's,' simplex, 7-in. x 5-in. x 12-in.

One general service pump, 'Drolet's,' vertical duplex, 6-in. x 4-in. x 6-in.

One shoot pump, 'Fairbank's' horizontal duplex, 8-in. x 6-in. x 12-in.

One sanitary pump, 'Blake' horizontal duplex, 4½-in. x 3½-in. x 4-in.

One engine and dynamo 11 K.W., Robb Engineering Co.

One feed heater, 'Weir's' surface type.

One feed water filter, 'Harris.'

One jet condenser and air pump combined, 'Blake.' Size of air pump: 12-in. x 18-in. x 24-in.

Boilers—

Two Scotch marine, single ended, 11 ft. 10 in. diam. inside x 10 ft. 0 in. long.

Working pressure: 130 lbs. per square inch.

Test pressure (Hyd.): 195 lbs. per square inch.

Shell ⅜ in. thick. One plate in length, 2 plates in circumference.

Longitudinal joint ¾-in. riveting circum. joint 1½-in. riveting.

Two 'Brown's' cambered furnaces 3 ft. 4 in. diam. inside, ⅝ in. thick, with drawable ends.

136 plain tubes, 8 I.W.G. thick.

58 stay tubes, ⅝ in. thick.

In all 194 tubes 3-in. ext. diam. and 7 ft. 0 in. long.

Total heating surface: 1,209 square feet.

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Grate area: 40 square feet.

Patent shaking grates, 6 ft. 0 in. long.

Weight of one boiler (bare) (shell only) without mountings: 47,500 lbs. 21.2 tons (long).

Boiler Mountings—One Boiler—

One 3-in. double spring safety valve.

One 4-in. main steam stop valve.

One 3½-in. aux. steam stop valve.

Two 2-in. combined stop and feed check valves.

One 2-in. bottom blow-off cock.

One 1½-in. surface blow-off valve.

One water gauge with 1½-in. connection.

Three test cocks.

Funnels. (2 off).

Weight of two together—8,055 lbs.—3.6 tons (long).

Smoke boxes. (2 off).

Weight of two together—5,400 lbs.—2.4 tons (long).

Two ash ejectors—own make.

Piping—

Steam and exhaust, copper.

Winch pipes, partly of iron and partly of copper.

Bilge pipes, lead.

Sanitary pump connection, iron.

Heating system, iron.

Main exhaust and air pump discharge, cast iron.

Deck water service, iron.

Other pipes, copper generally.

Frames, 4½ x 3 x ¾ spaced 24 inches.

Rev. , 3 x 3 x ¾.

Floors, 21½ x ¾ and ¾-in. machy, space. 1/20 in way of boiler.

Shell, keel 1/20, bottom 8/20 and 8/20, bilge 10 to 8/20, lower side 8/20, upper side, 10 to 8/20, sheer 1/20.

Well 1/20.

One bottom side keelson and two side stringers on ship's side and well sides.

Double fenders all fore and aft (top sides).

Frames, rev. floors, flat keel, C.V.K. and rider and side keelsons and part of shell, ordered 29th June, 1909.

Material commenced to come to hand, Sept., 1909.

Bulkheads, balance of shell, decks, stringers, beams and well plating and bulwarks, ordered 16th Sept., 1909.

Main framing. A frame and bucket ladder, ordered 17th Jan., 1911.

Commenced building, Dec., 1909.

No. 26 launched, 22nd Nov., 1910.

No. 26 will be finished, June, 1912.

—17 months from date of order of material to day of launching; and

—19 months to finish after launch—36 months to build.

INVOICED WEIGHT OF MATERIAL.

	Long Tons.
Steel Plates (inclusive bucket ladder and framing).....	428
" Angles " " " ".....	170
" Tees.....	1
" Channels.....	21
	620
Rivets.....	35
Invoiced material.....	656
Scrap off, say 5%.....	31
Net material.....	625

WEIGHT OF HULL.

	Long Tons.
Net weight of material.....	625
Blacksmith work, rails, stanchions, &c.....	8
E. R. and stokehold flooring.....	8
Wood work (joiner and carpenter).....	45
Cement.....	35
Outfit, boats, paint, castings, &c.....	29
Anchors, chains and wire ropes.....	26
Weight of hull.....	776

MACHINERY WEIGHT.

	Long Tons.
Dredging engine, gearing and top tumbler.....	67
Bucket ladder (in steel).....	—
Buckets, links, pins and bottom tumbler.....	115
Bow winch, 10-in. x 12-in.....	17
Hoisting winch and blocks, 10-in. x 12-in.....	35
Stern winch, 10-in. x 12-in.....	4
2 Breast-ing winches, 8 in. x 12-in.....	16
2 Capstans, 7-in. x 8-in.....	6
Derrick for lifting buckets.....	5
2 Boilers, complete.....	61
Water in boilers.....	25
Pumps, ash ejector, pipes, fittings, &c.....	18
	363
Equipped weight.....	1,139
D. W. Coals and stores.....	197
Lead displacement.....	1,336
Mean draft from scale, 9 feet, 2 inches.	

DRAUGHT TAKEN BY MR. BRIDGE, MARCH 23, 1912.

Forward.....	7 feet, 4 inches
Aft.....	6 " 2 "
Mean.....	6 " 9 "
Disp. per disp. curve.....	930 tons
Estimated weight to finish.—	
Wood w rk.....	16
Stokehold flooring.....	8
Castings and outfit.....	18
Main framing (to finish).....	10
Buckets and gear.....	115
Capstans.....	6
Derrick.....	5
Water in boilers.....	25
Piping and sundries.....	8
	209 "
	1,139 "
D. W.....	197 "
	1,336 "

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(Launching draft, 3-10 mean.....)	520 tons per scale)
(Bucket ladder in steel.....)	40 tons)
(Main framing in steel.....)	50 ")
(A " ".....)	20 ")

Per Mr. Bridges and Mr. Deans.

TIMBER USED IN CONSTRUCTION.

Used for Vessel.			
White pine (rough).....	16,389 feet, board measure, at \$40.....	\$	655 56
" " (prepared).....	5,905 " " " " 50.....		265 25
Red ".....	17,178 " " " " 45.....		773 01
Pitch ".....	540 " " " " 50.....		27 00
Spruce.....	3,136 " " " " 20.....		162 72
Elm.....	3,529 " " " " 60.....		511 74
Oak.....	437 " " " " 60.....		40 92
	<u>5.....</u>	\$	<u>2,445 20</u>

Used for Scaffolding and Ways.			
White pine.....	32,454 feet, board measure, at \$40.....	\$	1,286 56
Red ".....	1,123 " " " " 45.....		230 53
B. C. fir.....	1,032 " " " " 60.....		61 92
Spruce.....	17,151 " " " " 20.....		343 02
Elm.....	1,593 " " " " 60.....		95 58
Oak.....	3,922 " " " " 60.....		235 32
Basswood.....	196 " " " " 27.....		5 29
	<u>61,181.....</u>	\$	<u>2,253 22</u>

Weight of Timber used for vessel. (Not Scaffolding or Ways.)		Long
White pine.....	32,454	Tons.
Red ".....	1,123	19.3
Pitch ".....	540	26.8
Spruce.....	3,136	0.8
Elm.....	3,529	7.8
Oak.....	437	12.9
		<u>63.1</u>

The above all charged to cost of vessel, which is wrong to do.

FOR DREDGE No. 26.

COST OF BUCKET CHAIN.

50 steel rock digging buckets.....	3,975 lbs. each at	6c. per lb.....	\$ 11,925 00
150 cast steel links, bushed with manganese bushes.....	460 " " "	6c. " "	4,140 00
100 manganese steel bucket pins, 2 ft. 9 1/2 in. x 4 in. diameter.....	130 " " "	13c. " "	1,690 00
50 manganese steel short bucket pins.....	60 " " "	13c. " "	390 00
F.o.b. Sorel.....	<u>4,625.....</u>		<u>\$ 18,145 00</u>

APPROXIMATE COST OF SEATING OF MAIN HOISTING WINCH.

Approximate weight of plates and angles.....	22,221 lbs.		
Add for waste.....	1,333 "		
	<u>23,554 " at 1.48, say.....</u>	\$	350 00
Rivets.....	1,413 " at 2.50 ".....		35 00
Boilermakers (= 7 1/2c. per lb).....		\$1,844 16	
Carpenters.....		51 98	
Sawmill.....		3 95	
Mould loft.....		131 10	
		<u>\$2,031 19</u>	
Indirect, say (= 30 per cent).....		618 81	
			<u>2,650 00</u>
			<u>\$ 3,035 00</u>

PUBLIC SERVICE COMMISSION

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DREDGE No. 26.—COST TO DATE, 1st APRIL,

No. 26.	Machine.	Smith.	Boiler.	Cabinet.	Pattern.	Pipe.	Paint.	Yard.	Electric.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Hull	252 80	400 05	28,754 33	14 71	238 81	5 83	2,672 76	1,790 35	391 80
Machinery	840 89	79 27			70 16	6 72		458 44	
Boilers	2 31	275 33	4,734 80		6 00	23 19	2 95	239 69	
Main hoisting winch	2,017 11	462 91	1,844 16		566 43	2 10		242 84	
Main frame	10 87	43 96	4,234 24		37 83	0 69		123 26	
Frame "A"	0 88	0 91	1,519 00		172 44			82 73	
Cleaning sweeping and booming		0 83				0 39		1,037 21	
Bucket ladder	719 69	136 27	1,845 17		35 41			120 99	
Railings	21 42	776 01			0 75	213 24			
Steam and exhaust piping	91 64	7 99			462 87	172 16			
Crew quarters		0 35		33 90		0 82			
Stern winch	669 78	40 31			23 06				
Wooden foundations								170 05	
Scaffolding	3 23	7 25		7 06				221 19	
Ways	4 98	2 73						365 03	
Bucket chain complete	0 58				213 02			2 33	
Upper deck houses		7 70	1,348 44	437 92	8 93			32 69	
Bow cable winch	1,896 07	252 33	1 47		328 46			123 55	
2 breasting winches	2,017 36	201 23	2 15		18 39	5 73	10 73	220 61	
	9,449 52	2,695 63	44,334 79	498 58	2,182 58	435 92	2,686 44	5,320 01	391 80

NOTE.—(Buckets, links, pins and bushes complete contract \$18,000 per J. Bridge.)

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1912—(Taken from Cost Department Books.)

Carpenter.	Caulkers.	Teams.	Sawmill.	Mould Loft.	Drafting.	Asbestos.	Sewing.	Total Direct	Indirect.	Material.	Grand Total.
\$ cts.	\$ cts.	\$ cts.	\$ ct.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
2,216 75	191 78	291 79	242 89	3,888 49	3,307 50	389 74	.....	45,060 34	19,861 07	24,682 73	89,084 14
227 93	21 83	24 70	.....	861 48	.....	.....	2,543 92	1,039 50	354 96	3,938 38
.....	25 04	9 00	12 68	135 40	.....	.....	5,492 39	2,504 39	3,126 04	11,122 82
51 98	55 41	3 96	131 10	1,025 08	.....	.....	7,303 07	3,300 82	5,450 95	16,054 84
.....	29 33	4 93	274 17	451 71	.....	.....	5,250 99	2,400 53	2,012 37	9,673 89
.....	14 30	.....	110 87	56 99	.....	.....	1,968 12	752 12	1,054 21	3,764 45
.....	0 68	.....	.....	.....	.....	.....	1,039 11	267 97	6 56	1,313 64
104 57	30 64	.....	185 19	360 30	.....	.....	3,547 14	1,766 32	3,893 66	8,707 12
.....	0 68	.....	.....	118 58	.....	.....	1,130 68	018 65	348 97	2,098 30
.....	548 41	.....	.....	1,283 07	654 54	727 07	2,665 28
264 57	3 96	27 45	.....	.....	.....	.....	73 05	146 69	391 57	874 81
7 00	740 17	321 15	489 59	1,550 91
166 00	31 19	60 45	.....	.....	.....	.....	417 69	123 85	1,284 90	1,826 44
3,755 74	45 29	45 75	.....	.....	.....	.....	4,085 50	1,492 43	1,626 92	7,206 85
.....	352 80	60 86	33 48	.....	.....	.....	.....	819 38	503 23	642 12	1,764 73
.....	19 04	.....	.....	235 02	222 00	43 94	500 96
116 08	14 33	3 49	295 45	.....	.....	.....	2,324 03	979 60	1,222 80	4,526 43
18 50	17 62	.....	153 24	581 48	.....	.....	3,371 92	1,635 63	2,221 84	7,230 39
58 38	29 22	1 70	.....	33 34	.....	.....	2,549 57	1,083 47	3,151 14	6,334 49
6,976 58	544 58	672 17	457 79	5,051 10	7,451 31	389 74	.....	89,538 46	38,964 96	52,234 94	180,738 36

Indirect=43 per cent of Direct cost.

Dredge No. 26.—Cost as above to 1st April.....	\$ 180,738
" " To finish	97,132
Grand total includes indirect charges and duty.	\$ 277,870
Say.....	280,000
Appropriation	230,000

(DREDGE No. 26) COST TO COMPLETE FROM APRIL 1st, 1912.

	Material.	Labour, Indirect.
	\$ cts.	\$ cts.
Hull	10,160 00	9,548 00
Machinery	24,510 00	2,320 00
Boilers	610 00	1,275 00
Main frame	600 00	625 00
'A'	50 00	250 00
Cleaning, sweeping and booming		375 00
Bucket ladder	20 00	1,650 00
Railings	150 00	375 00
Steam, exhaust, feed, heating, water and bilge piping	3,500 00	2,750 00
Crews quarters	150 00	125 00
Wooden foundation		
Scaffolding		
Ways	18,100 00	315 00
Bucket chain, complete	1,500 00	4,125 00
Upper deck houses	10 00	100 00
Bow cable winches	2,029 00	1,000 00
Lighting system	3,245 00	65 00
Auxiliary machinery	7,000 00	
Equipment		
	71,734 00	25,398 00
Labour and indirect cost (=35%)	25,398 00	
Total	97,132 00	

NOTE—The cost of dredging machinery, auxiliaries, (except shoot winch) and the dynamo is included in the above, but they were all fixed on board before the above date.

ESTIMATED PROPER COST OF DREDGE No. 26.

\$ cts.

Invd. Material, plates and shapes (includes bucket ladder and main and 'A' framing and hoisting winch foundations)	620 long tons.	
Add E and B. flooring	8 "	
	628 "	
Plates and shapes, 628 at \$ 1.50 per 100 = \$35.40 per long ton.		
	Material.	Lab.
	628 at 35.40, 22,231.20	per lb., 31,651=53,832.
Rivets, 5½ p.c., 35 at 56.00, 1,960, 12c. "		9,380=11,310.
		65,222 00
		\$ cts.
Two stems		500 00
No quadrant tillers or rudders.		
Blacksmith work, rails, stanchions, davits, &c., 8 tons (18,000 lbs. at 10c)		1,800 00
Hoisting winch		10,000 00
Breasting winders (2 off)		6,000 00
Stern winch		1,200 00
Bow cable winch		5,400 00
Shoot		900 00
Capstans (2 off)		900 00
No steering gear.		
Wires and chains for bucket ladder, &c.		1,000 00
Boats (2 off)		600 00
Castings for deck		800 00
Cementing		700 00
Cooking range and utensils		700 00
Carpenter work		6,000 00
Clearing up		300 00
		36,800 00
		103,022 00
W. T. doors (2)		300 00
Electric light		4,500 00
Manilla		300 00
Hose, flags and sundries		200 00
Joiner work		5,000 00
Lamps, signal and berth		300 00

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ESTIMATED PROPER COST OF DREDGE No. 26—Continued.

Moulds and patterns.....	3,000 00	
Spars.....	200 00	
Plumbing.....	1,800 00	
Painting.....	2,000 00	
Pump Downton.....	200 00	
Rigging wire and work, splicing, &c.....	150 00	
Awnings and covers.....	250 00	
Steam heating.....	500 00	
Sidelights.....	500 00	
Telegraph.....	300 00	
Ventilation.....	250 00	
Wires for winches.....	3,000 00	
Sundries.....	3,000 00	25,800 00
		<hr/>
Maintenance, 20 per cent.....		127,822 00
		25,664 00
		<hr/>
		\$ 153,386 00

(DREDGE 26). ESTIMATE OF MACHINERY AND BOILERS.

Dredging machinery includes engines and gearings, wheels, top and bottom tumblers and bearings for same. Bearings and shaft for top end of ladder and small turning gear.

Fleming and Ferguson's contract (includes duty).....	24,190 00
Sorel work, erecting above machinery on ship, &c.....	1,800 00
Machine shop, general work.....	2,560 00
Buckets, links, pins &c. (i.e. bucket chain). Contract per Mr. Bridges \$18,100. Labour \$900	19,000 00
	<hr/>
	\$ 47,550 00.
2 main boilers, smoke boxes, etc.....	10,600 00
Auxiliaries, pumps, ash ejector, etc.....	4,000 00
Piping and sundries.....	6,000 00
	<hr/>
	\$ 68,150 00
Maintenance 20 per cent.....	13,630 00
	<hr/>
	81,780 00
Hull.....	\$ 153,386 00
Machinery.....	81,780 00
	<hr/>
	\$ 235,166 00 (say \$230,000).
Cost.....	280,000 00
Estimated proper cost.....	230,000 00
	<hr/>
Saving.....	50,000 00—18 p.c.

These dredges have been a long time in building and various charges, such as machine shop, blacksmith, boiler-makers, pattern makers, painting, yard, carpenters, caulkers, mould loft and drafting are excessively heavy, and but for the fact that the dredging machinery was purchased cheap, from an outside contractor, the total cost would have been considerably more.

The workmanship on the hull and machinery is very good, but extravagance in weight of material is very apparent throughout and a great want of proper thinking and scheming on the part of the drawing office officials (both hull and machinery). With proper supervision and management, these dredges could be produced at 18 to 20 per cent less cost and be in commission very much earlier, which is a condition worthy of consideration.

NOS. 36 AND 38 TWIN SOREW TUGS NOW BUILDING.

Length B.P. 84 ft. 6 in. O.A. 92-0 x 22-0 x 10-6 moulded.
 Frames 3 x 3 x $\frac{1}{4}$ spaced 21 inches.
 Reverse frames 2 $\frac{1}{2}$ x 2 $\frac{1}{2}$ x $\frac{1}{4}$.
 Bulkhead frames, single, 3 $\frac{1}{2}$ x 3 $\frac{1}{2}$ x $\frac{3}{16}$.
 Collision B.H. frames, single, 4 x 4 x $\frac{3}{16}$.
 Floors, 11 $\frac{1}{2}$ x $\frac{1}{4}$ -in., $\frac{3}{8}$ in engine space, and $\frac{5}{16}$ under boilers.
 Shell plating, $\frac{3}{8}$ to $\frac{1}{2}$.
 Keel plate, $\frac{3}{8}$ to $\frac{1}{2}$.
 Centre through vertical keel plate, $\frac{3}{8}$.
 Centre through vertical keel angles, 3 x 3 x $\frac{1}{4}$.
 Side keelson, double angles, 3 x 3 x $\frac{1}{4}$.
 Side stringer, double angles, 3 x 3 x $\frac{1}{4}$.
 Beams, 4 $\frac{1}{2}$ x 3 x $\frac{3}{8}$ on every frame.
 Bulkheads, $\frac{1}{4}$ -in.
 Bulkhead stiffeners, 4 $\frac{1}{2}$ x 3 x $\frac{3}{8}$ space 30 inches.
 Pavets all $\frac{3}{8}$ except flat plate keel, which will be $\frac{1}{2}$ -in.
 Rivets, spacing to Lloyds.

We overhauled this tug with Mr. Terreault, 22nd March, and asked him the reason for the following:—

Why are frames and reverse frames riveted together instead of a single bar?

Why have set floors on every frame from end to end of the boat when straight floors would do?

Why have keelsons made of double angles riveted back to back when a single bar would answer the same purpose?

Why the floors are punched out of solid plates instead of furnacing them, if they must run up the bilges?

Why the stem is made in three different pieces all welded together? The top part is a steel forging, the fore foot part is cast steel and the web end is made of steel plate—(a single rolled steel bar all in one piece would answer the purpose, and is universally adopted)

The sternpost is made of cast steel and the keel part is fancy shaped to suit the run of the waterlines, and the forward part is dished out. (Most absurd).

Bulkhead frames are close double riveted.

The connections of keelsons to bulkheads are excessively large.

The coal bunker walls are stiffened with 3 $\frac{1}{2}$ x 3 angles spaced same as the main frames and carried down over the bottom bar and tapered slips fitted—(stupid to do such things). The bunkers are quite narrow—the walls are far too heavily constructed.

Shell plate butts are strapped and double rivetted while they ought to be lapped—this makes a better job, less weight of material and fewer rivets.

The watertight bulkhead collars over keelsons, &c., are made of cast steel, a thing we have never come across in all our career. It means making a separate pattern for each, and steel castings are not easily got in this country. The cost of a steel casting as against an angle smith job is prohibitive.

Anywhere you look over this tug everything seems to have been designed to cost the most money.

Certainly those responsible do not know their work and are not modern ship-builders. Money is flung away right and left.

To all these questions, Mr. Terreault blamed other people, especially a man Bourgeois, who has gone seven months ago and was here four years, and that it was a case of use and wont. We think it is a case of want of knowledge all round, not looking into matters and considering the cost and modern ways of working. They are simply years behind in their methods and no one knows any better.

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(We were told by Mr. Terreault that the cost up to date including engines and boiler, wood work, &c., was \$19,000, and we were pleased as this looked reasonable; but to-day we are told that on further investigation the cost is over \$30,000).

Even 3-in. limber holes in keelsons are drilled instead of being punched out.

Sidelights are punched out and dressed.

No attempt made at joggling, scraping, flanging, &c., which is all against good modern practice (and no piece work).

A case of gross insubordination came under our notice when overhauling this tug. A riveter or a rivet heater, don't know which, immediately we passed commenced to sing and kept howling at the pitch of his voice. We asked Mr. Terreault, who was with us, what he did in a case of that kind (the man was evidently drunk)? He said he could do nothing except report to Mr. Papineau. That man, to give him his deserts, should have been fired on the spot by Mr. Terreault, as it is impossible for him to have any command over the men if they can do such things right in his face. On Mr. Terreault reporting to Mr. Papineau what the man was doing (and that we had said if the yard was ours he would have been fired in two minutes), he was not paid for the afternoon.

It is quite apparent that Mr. Terreault has no command and no authority to interfere in any way.

Riveters work four in a gang, instead of three, one man is always idle—asked the reason and were told it was simply the custom.

	No. 33.	No. 26.
Material ordered.....	October 8, 1910.	September 26, 1910.
Material commenced to come to hand.....	February, 1911.	February, 1911.
Commenced to build.....	July 21, 1911.	July 21, 1911.
Will launch.....	May, 1912.	June, 1912.
Finish.....	June 15, 1912.	August 15, 1912.
Are engines on board?.....	Yes.	No.
Are boilers on board?.....	Yes.	No.
Cabin work.....	Well advanced.	None.

The above statement was got from Mr. Terreault and Mr. Bridges, 23rd March, 1912.

We are informed the building of these boats was not pressed, sometimes only a few men employed.

It appears to us hanging so long over a job and changing the few men there were that the men will be disheartened and simply plod along killing time.

As to the question of cost—it has been a most difficult matter to get figures, and after we do get them we are not sure about their being correct—however, in the case of the tug we have investigated as far as possible, and find that No. 38 will cost when finished \$40,000, our estimate of the cost, allowing the same weight of material as they have (which is too high) and ample for government class of work, is \$30,000.

There seems to be no regard taken as to efficiency and location of material, due to strength, &c.

The same remarks apply to both hull and machinery, many of the patterns are old fashioned and very heavy—a lot of them should be destroyed.

BOILERS FOR TUGS NOS. 36 AND 38.

Single ended Scotch boiler, 11 ft. 10 in. inside x 10 ft. 0 in. long.

Two furnaces corrugated, 'Brown's' chambered withdrawable ends.

Diameter inside corrugation, 3 ft. 4 in., $\frac{1}{2}$ thick.

Thickness of shell, $\frac{15}{16}$ in.

Size of rivets, longit. joint, $\frac{7}{8}$ -in., circum., $1\frac{1}{8}$ in.
 How many plates in the round, 2.
 How many plates in the length, 1.
 No. of tubes, 136 plain 8 W.G. thick x 7 ft 0 in. long.
 No. of tubes, 58 stay tubes $\frac{3}{4}$ thick x 7 ft. 0 in. long.
 Heating surface. Total, 1,209 square feet.
 Grate area, 36 square feet.
 Working pressure, 150 lbs. per square inch.
 Hyd. test, 225 lbs.
 Grates, patent shaking grates, 5 ft. 6 in. long.
 Funnel—(inner) 3 ft. 0 in. dia. x 22 ft. 0 in. high above smoke box.
 (outer) 4 ft. 0 in. diam. x 21 ft. 6 in.
 Weight of both complete, 3,850 lbs (estimated).
 Weight of boiler (bare), 24 tons (estimated). (i.e., steel plates and rivet heads).
 Weight of smoke box, 1,950 lbs (estimated).

BOILER MOUNTINGS.

3-in. double spring safety valve.
 (2) Main steam stop valves, $3\frac{1}{2}$ bore.
 Aux. steam, $2\frac{1}{2}$ -in.
 Steam to whistle, $1\frac{1}{2}$ in.
 Steam to injector, $1\frac{1}{2}$ in.
 Steam to heaters (cabin), $1\frac{1}{2}$ in.
 Gauge glass, 1-in. Steam and water connection.
 (2) Feed check valves. 2-in. combined globe and check.
 Bottom blow-off, 2-in. cock.
 Main steam pipes copper.
 All the other connection are iron (practically).
 Feed pump, duplex, vert. $5\frac{1}{2}$ -in. x $3\frac{1}{2}$ -in. x 6-in.
 General service pump, duplex horiz., 6-in. x 4-in. x 6-in.
 Sanitary pump, duplex horiz., 3-in. x 2-in. x 4-in.

TWIN SCREW ENGINES FOR CONSTRUCTION NO. 36 AND 38.

Description—

Inverted compound two crank jet condensing engines.
 Size: H.P. 11-in. diam. L.P. 22-in. diam.
 Stroke, 15-in.
 Piston valve for H.P.
 Slide valve for L.P.
 Steam and hand reversing gear.
 Edward's air pump, feed and bilge pump, are worked by lever from L.P. cross-head.
 Back and front columns, cast iron.
 Diam. of propeller shaft, $5\frac{1}{2}$ -in.
 Diam. of crank shaft, $5\frac{1}{2}$ -in.
 Length from thrust to propeller, 19 ft. 0 in. to cr. of propeller. (Thrust shaft not included).
 Length of thrust shaft, 3 ft 9 in. x $5\frac{1}{2}$ -in. diam (4 collars $12\frac{1}{2}$ diam.)
 Propellers cast iron, solid, 4 blades, diam, 6 ft. 0 in., pitch 8 ft. 6 in.
 Revolutions of engines, 160.
 I.H.P., 350 collective.

SESSIONAL PAPER No. 57

TUGS Nos. 36 AND 38.—INVOICED WEIGHT OF MATERIAL.

	Long tons.	
Steel plates.....	58	
Steel angles.....	20	
	<hr/>	
Rivets.....	78	
	4	7½ tons were charged against the boat.
Invoiced material.....	82	
Deduct scrap.....	6	
	<hr/>	
Net weight of steel.....	76	long tons.
	<hr/>	
Net weight of steel.....	76	tons.
Smith's iron.....	2	"
Castings.....	2	"
Woodwork.....	8	"
Anchors, chains and windlass.....	5	"
Outfit, boats, &c.....	11	"
	<hr/>	
	104	"
MACHINERY—		
Boiler complete.....	28	
Water in boiler.....	12	
Engines.....	18	
Propellers, piping, &c.....	8	
	<hr/>	
	66	"
	<hr/>	
Equipped weight of hull.....	170	"
Deadweight.....	30	"
	<hr/>	
Displacement to 6'-3" draft.....	200	"

COST UP TO DATE OF CONSTRUCTION No. 38—(MARCH 23RD, 1912).

84'-6" B.P. x 22'-0" x 10'-6"

Description.	Dir. Cost.		Material.	Total.
	\$	cts.		
Hull.....	9,262	75	3,881	15,968
Machinery.....	797	73	5,836	6,653
Boiler, smoke box and funnel.....	2,422	60	1,128	4,398
Deck house.....	700	05	272	1,164
Scaffolding, block and ways.....	869	03	249	1,428
	<hr/>		<hr/>	
	14,052	16	11,219	29,613
				75
Total.....				\$ 29,613 75

ESTIMATED COST TO FINISH CONSTRUCTION No. 38 (FROM MARCH 23RD, 1912.)

Description.	Labour.	Material.	Total.
	\$	\$	\$
	cts.	cts.	cts.
Hull, deck and launching.....	1,000	500	1,500
Machinery.....	1,225	3,200	4,425
Steam and exhaust piping.....	600	2,000	2,600
Steam heating.....	100	60	160
Equipment (galley, plumbing, and deck of engine room)	680	720	1,400
	<hr/>	<hr/>	<hr/>
Total to finish.....			\$ 10,085 00
Total.....			\$ 39,698 75

Hull.....	\$ 15,968 34	
".....	1,500 00	\$ 17,468 34
Deck house.....		1,164 95
Scaffolding and ways.....		1,428 33
Steam and exhaust piping.....		2,600 00
Steam heating.....		160 00
Equipment (galley, plumbing and deck of engine room).....		1,400 00
Hull.....		\$ 24,221 62
Machinery.....	\$ 6,653 43	
	4,424 00	11,077 43
Boiler.....		4,398 70
		\$ 30,698 75

ESTIMATE OF PROPER COST OF TUG No. 38.

84'-6" B.P. x 22'-0" x 10'-6"

	Material.	Labour.	Total.
Steel plates and shapes, 78 long tons, \$35.40.....	2,750 at 2c.	\$ 3,494	\$ 6,224
Rivets, 4 long tons, \$56.00.....	224 at 10c.	896	1,120
			\$ 7,344
Moulds and patterns.....		250	
Castings.....		100	
False work.....		200	
Painting.....		1,000	
Windlass, anchors and chains.....		200	
Launch.....		200	
Carpenter.....		1,500	
Joiner.....		1,000	
Electric light.....		1,000	
Stern post and rudder.....		300	
Steering gear.....		100	
Boat and davits.....		250	
Cementing.....		100	
Cooking range, utensils, lamps, &c.....		300	
Cleaning up.....		100	
Sails.....		50	
Plumbing.....		150	
Covers, steam heating, &c.....		200	
Sidelights.....		100	
Telegraph.....		100	
Sundries.....		200	
			7,400
Engines.....			\$ 14,744
Boilers.....			4,600
Piping.....			3,300
			1,000
			\$ 23,844
Maintenance, 20 p.c.....			4,756
(Say \$30,000).....			\$ 28,600
Cost.....	\$ 40,000 00	Deck plan	} Attached.
Estimated proper cost.....	30,000 00	Longitudinal section	
Savings.....	\$ 10,000 00=25 p.c.	Midship section	

SESSIONAL PAPER No. 57

WOOD DUMP SCOWS.

CONSTRUCTION NO. 34.

It appears to us that building wood dump scows is a mistake financially (there may be reasons why they should be of wood which we do not know), but at any rate these scows are being built by the foreman carpenter, Mr. Nap. Lateau, who seems to do so in his own way; no one knows anything about how they are being built but himself. We think they are excessively heavy in construction.

The dimensions are 94 ft. 0 in. x 26 ft. 0 in. x 9 ft. 0 in., and they cost each \$15,770 launched complete ready for work.

The same scows built in steel would cost \$12,930, showing a difference of \$2,840.

(To prove that this statement is correct we know two scows that were built in steel of very heavy construction, equal to Lloyds for scantlings and riveting, with all outfit complete 130 ft. 0 in. x 30 ft. 6 in. x 10 ft. 0 in., actually cost \$14,725 to build).

Steel makes a better scow and is 50 tons lighter, carries at least 50 tons more spoil all the year round. The lifetime of a steel scow will be twice that of a wood one.

The only thing in favour of a wood scow is stranding and knocking about, but steel scows can be protected by fenders to withstand anything and are altogether better in every way.

These figures show for themselves our contention as to the cost of wood dump scows built here; two are finished and away and four more are in hand now.

There are a lot of elderly men working in a leisurely way, and as they move about they have wind screens, they move with them; and a very hot stuffy store place where two men are kept spinning oakum and keeping the stove burning. A great deal of time seems to be spent in this store, it is so comfortable.

The steel scow would float a great deal lighter and therefore carry more spoil.

Mr. Papineau explains that one reason for building wood scows is to have work to keep carpenters on hand in summer for slipping vessels and repairs, also that they stand stranding and knocking about better. We think that very questionable, as steel scows can be protected to any extent, and in modern practice wood scows are not built—this pertains the same in the old wooden ships days and the present day "all steel." Wood scows get very heavy and sodden in time, and are therefore worse to handle and more costly to tow.

All labour is done by hand, they don't even have a band saw or a boring tool except at odd times the assistance of an air boring machine.

PUBLIC SERVICE COMMISSION

3 GEORGE V., A. 1918

CONSTRUCTION

Cost of two Wood Dump Scows

Carpenter.	Caulkers.	Teams.	Saw Mill.	Drafting.	Total Direct.	Indirect.	Material.	Grand Total.
\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
59 53		0 68		230 58	230 58	85 76-37%		316 34
110 15		31 04		36 15	76 66	25 39-33%	0 12	102 17
					1,778 26	787 73-44%	3,392 86	5,968 85
4,919 20	1,340 29	118 53	393 24		7,967 61	2,952 74-37%	13,457 18	24,377 53
	222 70	28 77			333 02	114 33-31%	332 46	784 81
		0 68			1 08	0 53		1 61

Total..... 31,541 31
 cost of two
 10,392 21 3,966 48 17,152 63 (15,770 65
 Mean, 38% each.)
 Appropriation \$14,000 each.

SESSIONAL PAPER No. 57

No. 84.

= 94' - 0" x 28' - 6" x 8' - 6".

	Machine.	Blacksmith.	Boiler.	Cabinet.	Pattern.	Pipe.	Paint.	Yard.	Electrical.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Plans No. 34 C. 1223.....									
Blocks (keel) 1378.....								16 45	
*Hydraulic arrangement. 1401.....	818 95	119 18	163 29		56 48	19 60		423 42	
†Hull, 1430.....	66 15	565 53	37 40	4 80		50	75 95	439 93	
Launching, 1526.....	4 66	2 48						80 01	
Equipment, 1701.....								0 40	

* Includes 1 hand winch, 1 anchor, door gear, shafting, chains, &c. (Hydraulic pump is on tug).
 † Includes doors, door mountings, bolts, oakum, pitch, fairleads and iron knees.

WOOD AND STEEL SCOWS COMPARED—54 FEET 0 INCHES X 26 FEET 6 INCHES X 8 FEET 6 INCHES.

	Wood.	Steel.
Weight of hull.....	150	100 tons.
Draft (light).....about	3 ft. 6 in.	2 ft. 6 in.
Capacity of hoppers.....	200 cu. yds.	235 cu. yds.
Draft (loaded).....about	7 ft. 9 in.	7 ft. 9 in.

Would propose to make the hopper 9 inches wider than on drawings.

	Long Tons.	
Plates.....	106,000	calculated w ht.
Angles.....	41,864	" "
	<u>147,864</u>	
Add scrap 6 per cent.....	8,870	
	<u>156,734</u>	Invoiced weight plates and angles.
Add rivets 5 per cent.....	7,836	
	<u>164,570</u>	lbs. total invoiced material.

ESTIMATE OF COST.

	Long Tons.	Material.	Labour.
Plates and angles 70 tons at \$37.00.....		\$2,590 00 at 1 1/2 c.	\$2,352 00 = 4,942 00
Rivets 3 1/2 " at 56.00.....		196 00 at 10c.	784 00 980 00
			<u>5,922 00</u>
Moulds.....			200 00
Castings.....			100 00
False work.....			350 00
Painting.....			350 00
Door hinges, bolts and links.....			300 00
Chains and shackles, bolts, &c.....			560 00
Launching.....			200 00
Scow doors and lining and well.....			450 00
Fenders.....			250 00
Dumping device.....			2,000 00
Sundries.....			100 00
			<u>4,850 00</u>

Miscellaneous 20 per cent..... 10,772 00

2,168 00

Displacement of steel scow— \$ 12,930 00

2 ft. draft..... 78 x 26-5 x 2 70 x 9 x 2 80 tons.

Add for 1 ft. more draft..... 82-5 x 26-5 x 1 70 x 8-8 x 1

36 36 = 44 tons.
Add for 6 " 22 "

Light draught of steel scow 100 tons—say—2 ft. 6 in. 102 tons.

" " wood " 160 " " 3 ft. 6 in.

7 ft. 9 in. draft. 85 ft. x 26 ft. 5 in x 7-75 ft. 70 x 9 x 2 450 tons.

36 36

Steel scow..... 100 "

Deadweight..... 350 tons.

Wood scow..... 450 tons.

150 "

Deadweight..... 300 tons.

Steel scow 350 tons at 30 cwt..... 235 cu. yds.

Wood " 300 " 30 " 200 "

Total wood in present scows..... 76,000 B.M.

Wood scow cost..... \$ 15,770 00

Steel " " 12,930 00

Difference in cost due to steel..... \$ 2,840 00 = 18 p.c.

SESSIONAL PAPER No. 57

RECAPITULATION OF BUILDING COSTS.

Construction Number.	Kind of Construction.	Yard Cost.	Estimated Proper Cost.	Difference.
		\$	\$	\$
21.....	Lighthouse tender.....	336,692	240,000	96,692 29 p.c.
26.....	Elevator dredge.....	290,000	230,000	60,000 18 p.c.
38.....	Tug.....	40,000	30,000	10,000 25 p.c.

	In Wood.	In Steel.	
Wood Scaws—v—Steel.....	15,770	12,930	2,840

(\$159,532.00 = Total difference)

SOREL SHIPYARD—SALARIES.

February, 1911. February, 1912

	\$ cts.	\$ cts.
L. G. Papineau, director.....	250 00	250 00
M. A. Baril, accountant.....	150 00	
L. Lacouture, accountant.....		150 00
F. A. Cote, chief electrician.....	141 66	141 66
H. A. Terreault, superintendent.....	175 00	175 00
OFFICE.		
H. Einery, secretary.....	100 00	100 00
O. Cardin, asst. accountant.....	45 00	60 00
J. Peloquin, clerk (typist director's office).....	40 00	45 00
A. Desautels, messenger.....		0 60
TIME KEEPER.		
O. Champagne, time keeper.....	100 00	
A. Lusier, time keeper.....		100 00
W. Archambault, assistant, P. Boucher, later.....	1 45	1 75
A. Magnan, messenger.....	0 60	
COST DEPARTMENT.		
J. U. Latraverse, cost clerk.....	60 00	85 00
J. E. Rajotte, clerk.....	60 00	60 00
J. A. Prudhomme, clerk.....	38 33	45 00
H. Chapdelaine, clerk.....	1 45	40 00
J. Lanciault, clerk.....	1 20	40 00
STORE.		
N. Masse, storekeeper.....	85 00	
H. Chamberland, storekeeper.....		85 00
A. Lalonde, clerk.....	85 00	
H. Yergeau, clerk.....		85 00
C. A. Pelletier, clerk.....	80 00	
Art. Cote, checker.....	3 00	
R. Mayer, checker.....		80 00
E. L. Foy, clerk.....	55 00	55 00
T. Boudreau, clerk.....	55 00	55 00
P. Vandal, clerk.....	2 10	2 15
R. Lavallee, clerk.....	1 80	1 80
A. Paulhus, clerk.....	1 60	1 60
A. Beaudreau, clerk.....	1 60	1 60
J. D. Plamondon, clerk.....	1 20	33 00
DRAUGHTSMEN.		
J. P. Hereux, chief draughtsman.....	125 00	125 00
Fred Bridges, draughtsman.....	116 66	116 66
Jas. Deane, draughtsman.....	116 66	116 66
H. Dubuc, draughtsman.....	110 00	
A. Chartier, draughtsman.....		80 00
C. E. Houston, draughtsman.....	100 00	100 00
Au. Rondeau, draughtsman.....	85 00	
J. Lacouture, draughtsman.....		50 00
D. Lamarche, draughtsman.....	80 00	80 00
C. R. Blais, draughtsman.....	2 25	70 00
L. Deguise, draughtsman.....	1 75	50 00
H. Pontbriand, draughtsman.....	0 90	
G. Francoeur, draughtsman.....		33 00
G. Francoeur, draughtsman.....	0 80	
L. Turcotte, draughtsman.....		40 00
H. Johnston, draughtsman, clerk.....		1 45

SOREL SHIPYARD—SALARIES—Continued.

	WATCHMEN.	\$	cts.	\$	cts.
R. Lamoureux, watchman.....		2	00		
C. Trempe, watchman.....				2	00
J. Aussant, watchman.....		1	80	1	80
J. Lange, watchman.....		1	75	1	75
A. Peloquin, watchman.....		1	75	1	75
H. Girouard, watchman.....		1	75	1	75
F. Bellerose, watchman.....				1	75
A. Langlais, watchman.....				1	75
N. Laroche, watchman.....				1	75
SEWING ROOM.					
Mrs. C. Peloquin.....		1	00		
Mrs. D. Charbonneau.....		1	00	1	00
Mrs. C. Paul.....		1	00	1	00
Mr. L. Lachapelle.....		1	00		
STABLES.					
R. Lancault, stableman.....		1	60	1	60
H. Mongeon, helper.....		1	45		
Nap. Paul, helper.....				1	45
FIRE HOID No. 1.					
Z. Desrosiers, fireman.....		1	75	1	75
SUNDRIES.					
E. Merry, cleaner.....		1	60	1	60
G. Paul, helper.....		1	60	1	60

Name.	Occupation.	Salary.
		\$ cts.
Mr. F. A. Cote.....	Chief electrician.....	141 66 per month.
" N. Badeau.....	Foreman of all working depts.....	120 83 "
" J. Bilodeau.....	Machine shop.....	116 66 "
" J. Braconnier.....	Boiler shop.....	108 33 "
" S. Chateauvert.....	Blacksmith shop.....	95 00 "
" L. Cofeky.....	Mould loft.....	95 00 "
" J. Langlois.....	Pipe shop.....	95 00 "
" O. Gauthier.....	Pattern shop.....	95 00 "
" A. Gendron.....	Yard men.....	90 00 "
" A. Payette.....	Paint shop.....	85 00 "
" E. Lachapelle.....	Sawmill.....	80 00 "
" H. Legault.....	Asbestos department.....	2 90 per day.

Mr. J. Langlois took charge of the pipe shop on January 2, 1912. The foreman before was Mr. Ed. Gauthier.

Mr. A. Payette took charge of the paint shop on January 2, 1912. The foreman before him was Mr. J. B. Page.

SALARIES NOT DISTRIBUTED.

BLACKSMITH SHOP—

No. 76 S. Chateauvert.....	Foreman.
" 89 D. Lussier.....	Clerk.
" 93 P. Chevalier.....	Small steam hammer.
" 94 J. Hayden.....	Big steam hammer.

BOILER SHOP—

No. 1001 J. Braconnier.....	Foreman.
" 1050 W. Douaire.....	Clerk.
" 1021 A. Boucher.....	Pneu. tools.

CABINET SHOP—

No. 208 J. Paul.....	Clerk.
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CARPENTER SHOP—

N. Nadeau.....	Foreman.
S. Minard.....	Clerk.

ELECTRICAL SHOP—

No. ... F. A. Cote.....	Foreman.
" 536 R. Thibodeau.....	Clerk.

SESSIONAL PAPER No. 67

SALARIES NOT DISTRIBUTED—Continued.

MACHINE SHOP—		
No. 1	J. Bilodeau	Foreman.
" 53	E. Duplessis	Repairing tools (small tools).
" 65	A. Goulet	Labourer (sweep and clean)
	W. Casanbon	Assistant tools time
PAINT SHOP—		
No. 276	A. Payette	Foreman.
" 304	A. Lavallee	Clerk.
PATTERN SHOP—		
No.	O. Gauthier	Foreman
" 133	W. Lirette	"
" 134	E. Bolleroc	Clerk.
PIPE SHOP—		
No. 1511	J. Langlois	Foreman.
" 1548	A. Disorey	Clerk.
SAW MILL—		
No. 222	E. Lschapelle	Foreman
" 230	A. Lesieur	Clerk.
YARD—		
No. 601	A. Gendron	Foreman.
" 634	A. Joubert	Clerk.
" 620	P. Ethier	Messenger.
" 653	S. Huard	"
STABLES—		
	R. Loncault	Stableman.
	N. Paul	"
FIRE HOLDS Nos. 1 AND 2—		
No. 69	N. Charron	Fireman.
" —	Z. Desrosiers	"
" 1184	J. Longe	"
" 125	E. Chevalier	"
" 112	J. Joly	"
" 665	E. Chevalier	"
POWER HOUSE—		
No. —	F. A. Coté	Chief electrician.
" 527	J. Bonin	Electrician.
" 532	E. Rochette	"
" 538	C. Lavalee	"

SOREL SHIPYARD—RATE OF WAGES PAID, (ANY WORK, FOR TEN HOURS.)
MARCH, 1912.

Machinists.....	From \$1.70 to \$3.10	per day of 10 hrs.	Foremen, \$4.67 per day
" helpers.....	1.25 " 2.00	"	"
Turners.....	1.75 " 2.50	"	"
Fitters.....	1.60 " 2.25	"	"
Pattern makers.....	2.10 " 2.75	"	" 3.80 "
Moulders.....	"	"	"
Electricians.....	1.70 " 2.20	"	" 3.25 "
Pipe fitters.....	1.75 " 3.00	"	" 3.80 "
Joiners.....	1.75 " 2.40	"	" 2.75 "
Blacksmiths.....	2.00 " 3.00	"	" 3.80 "
" helpers.....	1.60 " 1.75	"	"
Boiler makers.....	1.75 " 2.75	"	" 4.55 "
Carpenters.....	1.75 " 2.25	"	" 4.35 "
Mould loft carpenters.....	1.75 " 2.00	"	" 3.80 "
Ship platers.....	1.60 " 1.80	"	" 2.70 "
Painters.....	1.55 " 2.10	"	" 3.40 "
Chippers.....	1.60 " 1.65	"	"
Caulkers.....	1.75	"	" 2.70 "
Drillers.....	1.60 " 1.75	"	"
Reamers.....	1.60 " 1.75	"	"
Riveters.....	1.60 " 1.90	"	"
Holden on.....	1.45 " 1.60	"	"
Heaters.....	0.50 " 1.00	"	"
Helpers.....	1.35 " 1.60	"	"
Boys.....	1.00 " 1.25	"	"
Sawmillers.....	1.40 " 1.70	"	" 3.20 "
Apprentices.....	0.50 " 1.25	"	"
Watchmen.....	1.75 " 2.00	"	"
Firemen.....	1.60 " 1.75	"	"
Labourers.....	1.35 " 1.70	"	" 3.60 "

Overtime, 1½ time after hours ; double time Sunday ; no piece work.

3 GEORGE V., A. 1918

SUMMARY SHOWING THE NUMBER OF EMPLOYEES

MARCH 16-31,

Department.	Foreman.	Foreman's Wages.	Number of men.	
			\$3.40.	\$2.25.
Asbestos.....	H. Legault.....	\$ 2.90 day.	22	...
Blacksmith.....	S. Chateauvert.....	95.00 month.	35	...
Boiler shop.....	J. Braconnier.....	108.33 "	238	...
Drafting.....	J. P. Heroux.....	125.00 "	11	...
Electrical.....	(See below).....		14	1
Machine shop.....	J. Bilodeau.....	116.66 month.	107	...
Mould loft.....	L. Cofsky.....	85.00 "	18	...
Paint shop.....	J. A. Payette.....	85.00 "	58	...
Pattern shop.....	O. Gauthier.....	95.00 "	11	...
Pipe shop.....	J. Langlois.....	95.00 "	28	1
Yard shop.....	A. Gendron.....	90.00 "	160	...
Carpenters shop.....	M. Badeau.....	120 83 "	93	...
Caulkers.....			19	...
Sawmill.....	E. Eschappelle.....	80.00 month.	26	...
		1,181.22	896	1 1

GENERAL STAFF.

	\$	cts.
L. J. Papineau, director.....	250	00
L. Lacouture, accountant.....	150	00
H. A. Terrevault, superintendent ..	175	00
F. A. Cote, electrical chief.....	141	66
	\$ 716	66

OFFICE STAFF.

	\$	cts.
O. Cardin, assistant accountant.....	month.	60 00
A. Lussier, timekeeper.....	"	100 00
R. Boucher, assistant timekeeper.....	day.	1 75
A. Desnanteis, messenger.....	"	0 60
H. Emery, director's assistant.....	month.	100 00
J. Peloquin, typist.....	"	40 00

GENERAL.

	\$	cts.
C. Trempe watchman.....	day.	2 00
J. Lange ..	"	1 75
J. Aussant ..	"	1 80
A. Peloquin ..	"	1 75
H. Girouard ..	"	1 75
A. Langlois ..	"	1 75
N. Laroche ..	"	1 75
R. Lanciault, stableman.....	"	1 60
N. Paul, helper.....	"	1 45
Mad. Charbonneau, sewing.....	"	1 00
Mad. J. Paul, sewing.....	"	1 10
G. Paul ..	"	1 60
E. Merry ..	"	1 00
J. Desrosiers, fireman.....	"	1 00

3 GEORGE V., A. 1918

SUMMARY SHOWING THE NUMBER OF EMPLOYEES IN

March 16-31, 1911.

(Daily Rates of Employees)

Department.	Foreman.	Foreman's Wages.	Number of Men.	\$3.40.	\$3.10-\$3.20.	\$3.00.	\$2.90.	\$2.75.	\$2.60.	\$2.50.	\$2.40.	\$2.25.	\$2.20.	\$2.15.
Asbestos.....	H. Legault.....	\$ 2.90 day	12				1			1				
Blacksmith.....	S. Chateauvert.....	95.00 month	38	1					1	2	1	1		
Boiler shop.....	J. Braconnier.....	108.33 "	272			1					1	7		2
Drafting.....	J. P. Heroux.....	125.00 "	10									1		
Electrical.....	(See below).....		16			1								2
Machine shop.....	J. Bilodeau.....	116.66 "	89			2		5	2	2	1	5		
Mould loft.....	L. Cofsky.....	3.40 day	13	1							1			
Paint shop.....	J. B. Page.....	85.00 month	63											
Pattern shop.....	O. Gauthier.....	95.00 "	13				1		2	1	1			2
Pipe shop.....	Ed. Gauthier.....	95.00 "	33	2				5						
Yard shop.....	A. Gendron.....	90.00 "	169											
Carpenter shop.....	N. Badeau.....	120.83 "	97									5		
Caulkers.....			23							1				
Saw mill.....	E. Lachapelle.....	80.00 "	27											2
			875	1	3	3	2	12	4	8	11	13	2	6

GENERAL STAFF.

L. G. Papineau.....	Director.....	\$ 250 00
A. Baril.....	Accountant.....	150 00
F. A. Cote.....	Electrician.....	141 66
		<u>541 66</u>

OFFICE STAFF.

O. Cardin.....	Asst. accountant\$	45 00
G. Champagne.....	Timekeeper.....	100 00
H. A. Terrault.....	Supt. of Ways..	175 00
H. Archambault.....	Asst. timekeeper	1 45 day
A. Magnon.....	Messenger.....	60 "
H. Emery.....	Director's sec'y..	100 00 month
J. Peloquin.....	" typist	40 00 "

STORES.

Norman Masse.....	Storekeeper.....	\$ 85 00 month
C. A. Pelletier.....	Clerk.....	80 00 "
A. Cote.....	Rec. clerk.....	3 00 day
A. Lavallee.....	".....	1 80 "
A. Paulhus.....	".....	1 60 "
A. Beaudranet.....	".....	1 60 "
P. Vandal.....	".....	2 10 "
T. Boudreau.....	".....	85 00 month
A. Lalande.....	".....	85 00 "
E. Foy.....	".....	65 90 "
J. D. Plamondon..	".....	1 20 day

SESSIONAL PAPER No. 57

EACH DEPARTMENT, ALSO THE DAILY RATES PAID.

Wages as per Time Book.)

\$2.10.	\$2.05.	\$2.00.	\$1.90-\$1.95.	\$1.85.	\$1.80.	\$1.75.	\$1.70.	\$1.65.	\$1.60.	\$1.55.	\$1.50.	\$1.45.	\$1.40.	\$1.35.	\$1.35.	\$1.35.	\$1.05-1.10-1.15.	\$1.00.	90 cents.	90 cents.	75 cents.	70 cents.	60 cents.	50 cents.	\$1.25 month.	\$1.20.83.	\$1.16.66.	\$95.	\$90.	\$85.	\$80.	\$1.00.	\$1.10.	\$108.33.	
2	1	2	1	3	1	5	2	1	11	1	1	1	1	7	3	1	1	3	4	3	2	6	2	14	1	2	1	1	1	1	1	1	1	12	
1	4	7	3	33	13	42	3	4	34	1	1	1	77	3	1	3	4	3	2	3	2	2	2	1	2	1	1	1	1	1	1	1	33		
1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	10		
2	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16		
2	8	2	1	9	5	8	8	2	8	1	3	2	1	3	2	1	2	1	3	2	3	2	2	1	1	1	1	1	1	1	1	1	89		
2	2	1	1	7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	13			
2	4	1	1	4	3	14	10	1	1	1	1	1	17	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	63			
1	1	2	2	3	1	1	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	13			
1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	33			
2	2	7	63	1	1	6	2	7	4	26	118	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	169			
2	15	1	3	1	1	3	2	1	3	1	3	1	3	1	3	1	3	1	3	1	3	1	3	1	3	1	3	1	3	1	3	97			
2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	23			
10	229	34	13	3	149	31	21	82	19	19	48	31	238	4	5	4	8	5	3	10	6	17	1	1	3	3	3	1	2	1	1	1	875		

RECAPITULATION.

Department distribution.....	875
General staff.....	3
Office staff.....	7
Stores.....	11
Cost department.....	5
Miscellaneous general.....	15
	<hr/>
	916

COST DEPARTMENT.

U. Latraverse.....	Chief clerk.....	\$	60 00	month
E. Rajotte.....	Clerk.....		60 00	"
A. Prudhomme.....	"		38 33	"
J. Lanciult.....	"		1 20	day
H. Chapdelaine.....	"		1 45	"

MISCELLANEOUS GENERAL.

R. Lamoureux.....	Watchman.....	\$	2 00	day
J. Lange.....	"		1 75	"
J. Aussant.....	"		1 80	"
A. Peloquin.....	"		1 75	"
H. Girouard.....	"		1 75	"
F. Bellerose.....	"		1 75	"
Mde. C. Paul.....	Sewing.....		1 00	"
Mde. C. Peloquin.....	"		1 00	"
G. Paul.....	Helper (Store)...		1 60	"
E. Merry.....	"		1 60	"
L. Lachapelle.....	Helper.....		1 60	"
R. Lanciult.....	Stableman.....		1 60	"
H. Mongeon.....	"		1 45	"
G. Francoeur.....	Helper.....		90	"
Z. Desrosiers.....	Fireman.....		1 75	"

EMPLOYEES DISCHARGED FROM SOREL SHIPYARD FOR LACK OF WORK
AND UNRULY HABITS.

Yard Number	Name	Occupation	Date of Appointment	Date of Discharge	Reason for Discharge.
1143	J. Peloquin	Helper	Jan. 16, 1911.	Mar. 31, 1912.	Dispensed with on account of scarcity of work.
1128	A. Lavallee	Blacksmith	Feb. 16, 1912.	"	" " "
1124	J. Niquette	"	Feb. 16, 1912.	"	" " "
1177	A. Goussier	Labourer	Mar. 4, 1912.	"	" " "
1472	H. Allard	"	Nov. 16, 1911.	"	" " "
1486	H. Cosmayer	Heater	June 19, 1910.	"	" " "
1183	H. Goussier	Helper	June 10, 1910.	"	Staying away from work too often.
1130	M. Cosmayer	Boilermaker	Feb. 16, 1912.	"	Dispensed with on account of lack of work.
1465	J. R. Ensed	"	Mar. 4, 1912.	"	" " "
1140	A. Salvard	Helper	—1909	"	" " "
1459	O. Salvard	"	Mar. 7, 1911.	"	" " "
1100	E. Latour	"	—1900	"	" " "
1183	J. Renaud	Labourer	Nov. 29, 1911.	"	" " "
1477	A. Gladu	"	April 1, 1910.	"	" " "
1459	N. Laprade	Helper	Dec. 4, 1911.	"	" " "
1181	C. Paul	Labourer	Dec. 4, 1911.	"	" " "
1134	H. Potvin	"	Jan. 10, 1912.	"	" " "
1505	G. St. Germain	Heater	Aug. 16, 1911.	"	" " "
1467	J. Champagne	"	—1909	"	" " "
1471	J. B. Cosmayer	Labourer	Sept. 16, 1908.	"	" " "
1056	J. Lirett	Boilermaker	—1904	"	" " "
1054	A. Chretien	"	Dec. 6, 1911.	"	" " "
1500	J. Bibeau	Labourer	Dec. 11, 1911.	"	Losing time in idle discussions.
1179	Ls. Thibault	"	Feb. 24, 1911.	"	Dispensed with on account of scarcity of work.
1198	J. Cosmayer	"	Dec. 11, 1911.	"	" " "
1113	E. Lariviere	Boilermaker	Aug. 1, 1906.	"	" " "
2192	J. Crete	Labourer	Nov. 21, 1911.	"	" " "
1517	P. Caissy	Heater	Nov. 12, 1911.	"	Unruly.
1043	J. Bellerose	Boilermaker	Dec. 11, 1911.	"	Dispensed with on account of scarcity of work.
1463	D. Aubuchon	Helper	Nov. 6, 1911.	"	" " "
1031	J. Peloquin	Boilermaker	—1888	"	" " "
1438	R. Plasse	Helper	Mar. 8, 1910.	"	" " "
1301	H. Vilandre	Heater	July 26, 1911.	"	Unruly.
1145	J. Delizaire	Helper	Jan. 8, 1907.	"	Loses time without good reason.
1175	J. B. Jounille	Labourer	July 10, 1911.	"	Loses time in idle discussions.
1191	L. Desautels	"	Nov. 29, 1911.	"	" " "
1155	F. Bessit	Helper	—1907	"	" " "
1401	P. Mongeau	"	Mar. 16, 1910.	"	" " "
1435	A. Mcogean	"	"	"	" " "
1491	J. Lamoureux	Heater	July 19, 1911.	"	Loses time without good reasons.
1482	E. C. Joly	"	Oct. 17, 1910.	"	" " "
1137	A. Courtois	Helper	Dec. 4, 1911.	"	Loses time on account of drink.
1186	O. Gravel	Labourer	Dec. 6, 1911.	"	" " "
1130	N. St. Martin	Boilermaker	—1902	"	" " "
1193	J. Champagne	Labourer	Nov. 21, 1911.	"	Unruly.
1458	J. St. Laurent	Helper	Oct. 3, 1910.	"	Dispensed with on account of scarcity of work.
1407	N. Lavallee	"	Oct. 19, 1910.	"	" " "
1430	F. Paul	"	Sept. 28, 1908.	"	" " "
760	A. Gouin	Labourer	Jan. 24, 1912.	"	" " "
1433	F. St. Jacques, fils	Helper	Oct. 7, 1904.	"	" " "
1496	D. Mathe	Heater	—1910	"	" " "
1429	C. Metivier	Helper	Sept. 21, 1908.	"	" " "
1428	L. Guevremont	"	—1902	"	" " "
1404	P. St. Amand	"	Aug. 17, 1908.	"	" " "
1066	T. Langlade	Boilermaker	—1907	"	" " "
1507	L. Raymond	Heater	June 10, 1911.	"	" " "
1186	P. Godin	Labourer	Oct. 25, 1911.	"	" " "
1476	A. Harpin	"	Dec. 20, 1911.	"	" " "
1449	A. Cosmayer	Helper	Aug. 24, 1908.	"	" " "
1469	P. Mathieu	Labourer	Nov. 16, 1911.	"	" " "
1148	C. Leticie	"	Nov. 1, 1911.	"	" " "
841	J. Faucher	Boilermaker	Jan. 16, 1912.	"	" " "
839	T. Arrel	Labourer	Jan. 16, 1912.	"	" " "

SESSIONAL PAPER No. 57

EMPLOYEES DISHARGED FROM SOREL SHIPYARD, &c.—Concluded.

Yard Number.	Name.	Occupation.	Date of Appointment.	Date of Discharge.	Reason for Discharge.
822	E. Caissy	Plater	Jan. 22, 1912.	Mar. 31, 1912.	Loses time without good reasons.
1190	A. Godin	Labourer	Feb. 11, 1904.	"	Loses time on account of drink.
1197	H. Allenberg	"	July 18, 1911.	"	"
1460	A. Beland	Helper	Oct. 17, 1910.	"	Loses time without good reasons.
1031	A. Girard, pere	Boilermaker	Oct. 5, 1906.	"	Loses time on account of drink.
1083	E. Jacques	"	July 1, 1908.	"	"
1146	A. Cotnoir	Labourer	Oct. 2, 1904.	"	Loses time without good reasons.
1080	H. Cautera	Boilermaker	Oct. 9, 1911.	"	Loses time on account of drink.
1189	A. Girard, fils	Labourer	Aug. 17, 1908.	"	"
1446	A. Cartier	Helper	Dec. 1, 1911.	"	"
1461	V. Lavallee	"	Nov. 3, 1911.	"	"
1488	O. Latraverse	Heater	Oct. 30, 1911.	"	Unruly.
1512	L. Berard	Helper	Nov. 16, 1911.	"	"
1447	V. Beaulo	"	Nov. 13, 1911.	"	Loses time on account of drink.
1439	R. Boiavert	"	Dec. 20, 1911.	"	"
820	A. Morin	Machinist	Jan. 22, 1912.	"	"

SUMMARY.

Helpers, 29; boilermakers, 14; labourers, 26; platers, 1; Machinists, 1; total, 79.

EMPLOYEES ABSENT ON THE AFTERNOON OF GOOD FRIDAY, APRIL 5, 1912, AS PER PUNCH-KEEPER'S REPORTS.

Card No.	Name.	Department.	Card No.	Name.	Department.
5	F. Beaulac	Machine shop	464	E. Beaulieu	Carpenter.
7	H. Roberge	"	467	John Stables	"
44	E. Thesault	"	487	J. Lalancette	"
48	J. Domers	"	529	S. Simard	Electrician
49	E. Prudhomme	"	252	A. St. Arnault	Asbestos dept.
53	E. Duplessis	"	254	F. Latour	"
85	J. Cardin	Blacksmith shop.	303	H. Paul	Painters' shop.
104	P. Nadeau	"	523	R. Blanchemin	"
115	A. Champagne	"	328	T. Barabe	"
122	Z. Guertin	"	334	L. Villandre	"
141	A. Harpin	"	340	E. Caissy	"
106	A. Dauphinais	"	1030	G. Lambert	Boiler maker.
778	V. Latour	Yard.	1041	A. Maclure	"
602	B. Coumoyer	"	1108	P. Ethier	"
641	P. Coumoyer	"	1117	A. Gailloux	"
663	N. St. Martin	"	1126	E. Lalancette	"
671	J. Chevalier	"	1127	H. Plante	"
675	C. Guertin	"	1138	D. Dumais	"
683	D. Chevalier	"	1151	P. St. Martin	"
691	E. Jemoine	"	1162	A. Latour	"
697	J. Laforest	"	1172	A. Pelletier	"
698	Z. Cotnoir	"	1180	J. Latour	"
708	E. Moreault	"	1418	A. Latraverse	"
711	L. Paulhus	"	1417	A. Pelletier	"
724	A. Cotnoir	"	1422	E. Coutara	"
727	J. Cayer	"	1454	H. Gladu	"
734	J. Guevremont	"	1484	J. Coumoyer	"
739	L. Guevremont	"	1490	J. Bonin	"
771	O. Godin	"	1510	O. Charbonneau	"
777	P. Latour	"	1515	L. Gendron	"
775	V. Godin	"	1525	A. Cayer	"
770	A. Valois	"	835	F. Cardin	"
405	A. Plante	Carpenter.	837	L. Ducharme, fils	"
407	E. Pelletier	"			
418	D. Millette	"		Total.....	68

3 GEORGE V., A. 1913

MEN PAID OFF BY ORDER OF THE DEPARTMENT.

	1911.			1912.	
	Oct.	Nov.	Dec.	Jan.	Feb.
Boiler makers.....	20	14	4		7
Fitters.....	6	2	2	1	1
Labourers.....	5	1	1	2	6
Caulkers.....	1				1
Steamfitters.....	4		1 fore.	1	
Mould loft.....	1				
Carpenters.....	4				1
Labourers.....	1				
Rivet heaters.....	2				1
Labourers (asbestos).....	1				
Painters.....	2		1 fore.		52
Electrician.....		1			
Clerks (office).....			2		
Chief acct.....			1		
Timekeeper.....			1		
Checker of goods.....			1		
Storekeeper.....			1		
Watchmen.....					1
	47	18	15	4	70

Total..... 154

COST OF MATERIALS.

Material.	Buying Rates.	Remarks.
Beech wedges used.....	4:1c. each.	
Gasolene.....	(200 gall. lots) 16c. per gall.	
Candles.....		
Assorted nails.....	\$2.40 per 100 lbs.	
Coal oil.....	Contract 200-600 gall., 11c. per gall. ✓	
Washers.....	4½c. per lb.	
Bolts (ordinary sq. heads).....	2 x ½-in. at 2½c. each; 2-in., per lb., 4c.; 2 x ¾-in. at 2½c. each; 2-in., 3½c.	
Steel plates.....	\$1.56 per 100 lbs.	
" angles.....	\$1.46 "	
" channels.....	\$1.56 "	
" flats or liners.....	\$1.56 "	
Assorted rivets.....	¾ x ½-in., 2½c. per lb.	
Hexagon nuts.....	¾ to ¾-in., 6c. per lb.; ¾ to 1-in., 6c. lb.	
White paint for marking.....	11c. per lb. (ready for use.)	
Putty.....	\$1.90 per 100 lbs.; 2c. per bar.	
Linseed oil.....	92c. per gall.	
Drilling oil.....	30c. "	
Charcoal.....		
Tallow.....	8c. per lb.	
Oakum, spun.....	At 6c. per lb.; bale, \$50.	
Ships spikes.....	\$2.80 per 100 lbs.; bale, \$50.	
Babbit, genuine.....	20c. per lb.	
Brass castings.....	20c. to 28c., gunmetal.	
Sheet rubber.....	16½c. per lb.	
Felt for ships.....		
Tacks for templates.....		
Rubber valves for pumps, &c.....	\$1.16 per lb.	
Manila ropes.....	8½c. per lb.	
No. 21-1½-in. steel chain.....	\$3.26 per 100 lb.	
" --stockless anchors.....	Jan., 1912, \$3.18 per 100.	
Common anchors.....	Sept., 1911, \$3.26 "	
Soft steel for wedges.....	2½c. to 3c. per lb.	
Drift pin steel.....	6c. to 8c. per lb.	
Tool steel.....	14c. per lb.	
Round iron for bolts, &c.....	½, ¾, 1, 1½, 1-in., \$2.43, \$2.12, \$1.85, \$1.83, \$1.83 per 100 lbs.; 1 to 1½- in., \$2.05 per 100 lbs.	
Square iron for bolts, &c.....	\$2.05 per 100 lbs., all sizes.	
White paint for painters.....	11c. per lb. (ready for use.)	
Pins for templates.....		
Lignum vitae.....		
Oak, white.....	\$60-\$70 per 1,000 ft. B.M.	
Rock elm.....	\$60 "	
Bas wood templates.....	\$27 "	
Hemlock.....		
Norway.....	\$40 "	
Pitch pine.....		
Yellow pine.....		
Teak.....		
Maple.....	\$50 "	
Beech.....		
Birch.....		
Red pine.....	\$45 "	
Slabs.....	\$2 a cord.	
Spruce, planed.....	\$39.75 per 1,000 ft.	
Rivet fire coke.....	\$7.50 per ton of 2,240 lbs.	
Blacksmith coal.....	\$5.60 " "	
" coke.....	\$7.50 " "	
Cement.....	58½c. per 100 lbs.; \$1.91 per bbl.	
Sand.....	\$1.53 per cu. yd.	
Boiled linseed oil.....	92c. per gal.	
Turpentine.....	70c. "	
Mixed paint.....	11c. "	
Red lead putty.....	5½c. per lb.	
Packing, H.B.O., &c.....	60c. per lb.; ¾ x ½-in., 60c., 1x1-in., 60c.	
Coals, ordinary.....	\$4.10 per 2,240 lbs.	
Furnaces, bar and plate.....		
" chain falls.....		
" steam inch.....		
" air to.....		
" rivet furnaces.....		

(Selling prices same as buying; 5% for handling and insure there is no loss. No repairs done for private firms.)

LIST OF ARTICLES MANUFACTURED BY COMMISSION.

Articles.	Cost.	Remarks.
TINWARE.		
	\$ cts. each.	
Megaphones.....	2 44 "	
Tin tallow pots.....	0 34 "	
Tea pots, 2 galls.....	0 83 "	
Dippers, 1 qt.....	0 27 "	
Tea kettles, 2 galls.....	0 96 "	
" large, 5 galls.....	0 95 "	
Oil cans, 1 pt.....	0 33 "	
Marine water cups, 1 pt.....	0 25 1/2 "	
Cannisters, 1 gall.....	0 65 1/2 "	Fair market value, 50 p.c. less than prices here shown.
Stove pipe elbows, 7 in. dia.....	0 22 "	
" lengths, 7 in. dia.....	0 09 1/2 "	
Cups, 1 pt.....	0 12 1/2 "	
Dripping pans, 18 in. x 12 1/2 in.....	0 71 "	
" 8 in. x 14 in.....	0 40 1/2 "	
Taper pipes, 7 in. x 5 in.....	0 12 1/2 "	
Dust pans, 9 in. x 12 in.....	0 25 1/2 "	
Pans, 9 in. x 9 in.....	0 16 1/2 "	
Cups, 1/2 gall.....	0 30 1/2 "	
Water syphons, complete, 2 1/2 in.....	2 93 "	
Dish pans.....	0 43 "	
Milk cans, 1 gal.....	0 46 1/2 "	
Milk pans, 1 gall.....	0 08 1/2 "	
Oil cans, 1 gall.....	0 44 "	
Cannisters having spout, 1 qt.....	0 23 1/2 "	
GALVANIZED WARE.		
Water pail, 2 galls.....	0 45 1/2 "	
DRY GOODS.		
White aprons (butcher linen) for cooks, 42 in. x 36 in.....	0 24 "	
Cotton deck mitts.....	0 31 pair.	
Dish cloths.....	0 14 each.	
Signal flags.....	1 00 1/2 "	
Coloured pillow covers.....	0 12 1/2 "	
Roller towelling, 75 in. x 17 in.....	0 18 "	
MISCELLANEOUS.		
Bucket pins, 3 1/2 in. x 32 in.....	4 29 "	
Ice refrigerator, 8 ft. 6 in. x 3 ft. 3 in. x 6 ft.....	67 26 "	
Solder.....	0 34 lb.	
Cold chisels.....	1 55 each.	
Roller pins.....	0 13 1/2 "	
Tin measures, 1/2 gall.....	0 30 "	Fair market value, 50 p.c. less than prices here shown.
" 1 ".....	0 50 "	
" 1 1/2 ".....	0 70 "	
" 1 ".....	0 86 1/2 "	
Coal scuttles.....	0 68 "	
Ice tongs.....	1 35 "	
Galv. cans, 1/2 gall.....	0 57 "	
" 2 ".....	0 35 "	
Engineer lamps, 1/2 pint.....	0 15 "	
Gasoline tank, 50 galls.....	16 80 "	
Sample oil cans, 1 qt.....	0 30 1/2 "	
Chain hooks, 1/2 in. x 30 in.....	2 30 "	
Oar locks, 2 1/2 in.....	1 75 pair.	
" 1 ".....	1 02 1/2 "	
Life boats, 18 ft. x 6 ft.....	164 74 "	
" 16 ft. long.....	120 00 "	
" 20 ".....	138 38 "	
Shackles, 1 in., (iron).....	1 00 "	
Mattresses (6 yds. ticking, 32 1/2 lbs. sea moss).....	3 75 each.	
Bed sheets (single).....	0 52 "	
Bath towels.....	0 15 "	
Pine bignets, 1/2 in. planed and grooved.....	79 c. per M. ft.	
Ice refrigerators 48 x 30 x 66.....	103 41 "	
" drawing No. 13172.....	87 23 "	
" 54 x 30 x 72.....	67 26 "	

SESSIONAL PAPER No. 57

LIST OF ARTICLES MANUFACTURED BY COMMISSION—Continued.

Articles.	Last cost of Manufacture.	Remarks.
BRASS BAND COVERING.		
Brass band covering $\frac{3}{4}$ inch.....	0 18 "	
" " 1 "	0 24 "	
" " $1\frac{1}{4}$ "	0 30 "	
" " $1\frac{1}{2}$ "	0 36 "	
" " 2 "	0 48 "	
" " $2\frac{1}{2}$ "	0 60 "	
" " 3 "	0 72 "	
" " $3\frac{1}{2}$ "	0 84 "	Fair market value. 50 p.c. less than prices here shown.
" " 4 "	0 96 "	
" " $4\frac{1}{2}$ "	1 08 "	
" " 5 "	1 20 "	
" " $5\frac{1}{2}$ "	1 30 "	
Tin bands	0 02 each.	
" " $1\frac{1}{2}$ "	0 02 $\frac{1}{2}$ "	
" " 2 "	0 03 $\frac{1}{2}$ "	
" " $2\frac{1}{2}$ "	0 04 $\frac{1}{2}$ "	
" " 3 "	0 05 "	
" " 4 "	0 06 $\frac{1}{2}$ "	
" " $4\frac{1}{2}$ "	0 07 $\frac{1}{2}$ "	
" " 5 "	0 08 $\frac{1}{2}$ "	
Asbestos pipe covering $\frac{3}{4}$ "	0 10 ft.	
" " 1 "	0 12 "	
" " $1\frac{1}{2}$ "	0 15 "	
" " $1\frac{1}{2}$ "	0 26 $\frac{1}{2}$ "	
" " 2 "	0 22 "	
" " 2 "	0 25 $\frac{1}{2}$ "	
" " 3 "	0 26 $\frac{1}{2}$ "	
" " $3\frac{1}{2}$ "	0 27 $\frac{1}{2}$ "	Fair market value. 50 p.c. less than prices here shown.
" " 4 "	0 41 "	
" " $4\frac{1}{2}$ "	0 53 $\frac{1}{2}$ "	
" " 5 "	0 58 $\frac{1}{2}$ "	
" " 5 "	0 58 $\frac{1}{2}$ "	

NOTE—These goods were manufactured during the months of October and November, 1911 and January, 1912.

NEW WORK—SOREL SHIPYARD WORK IN HAND MARCH 15, 1912.

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No.						
26	Steel elevator dredge.....	¾ finished.....	180' x 40' x 14'	Dredging machinery.....	17" x 34" x 36"	Fleming & Ferguson. Made in Sorel.
33	Steel dumping scow.....	¾ ".....	108' x 22' x 9'	Two boilers.....	12' x 10'	Made in Sorel.
34	(Two) Wood dumping scows.....	¾ ".....	94' x 26' x 9'	Hydraulic machinery.....		Made in Sorel.
35	Steel tug.....	¾ ".....	32' x 24' x 10'	" ".....		Made in Sorel.
37	Steel elevator dredge.....	½ ".....	180' x 40' x 14'	Twin screw engine.....	11" x 22" x 18"	S. John Engine work. Made in Sorel.
38	Steel tug.....	½ ".....	92' x 24' x 10'	One boiler.....	12' x 10'	Not yet ordered.
39	Wood testing scow.....		78' x 38' x 7½'	Dredging machinery.....		Made in Sorel.
40	Steel rock crusher.....	¾ ".....	100' x 36' x 9'	Two boilers.....	12' x 10'	Made in Sorel.
41	Steel rock crusher.....	Material ordered.....		Twin screw engine.....	11" x 22" x 18"	St. John Engine Works. Made in Sorel.
42	(Two) Wood dumping scows.....	Just started.....	94' x 26' x 9'	One boiler.....	12' x 10'	Made in Sorel.
				Winches.....		Made in Sorel.
				Machinery and boiler.....	9' x 8½'	From Lobnitz & Co.
				Machinery in yard.....		
				Boiler not yet decided on.....		
				Hydraulic machinery.....		Made in Sorel.

64 boats tied up during the Winter 1911-12.

REPAIR WORK.

PUBLIC SERVICE COMMISSION

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SOREL SHIPYARD—APPROXIMATE VALUATION OF PLANT AT MARCH 15, 1912.

MACHINE SHOP.

No. 1 Bolt cutter 1½ in.	200
2 " " 2½ in.	500
3 Small planer, 8 ft. Led—8 ft.-0 in. x 2 ft.-0 in.	1,200
4 Lathe 8-4 centres 20 in. swing	650
5 Shaper, 16 in. travel	400
6 Radial drill	1,000
7 Boring mill—face plate 4-10	2,500
8 Drill 21 in. swing	250
9 " " "	250
10 " " "	250
11 Lathe—4-6 between centres 17 in. swing	350
12 Universal miller	600
13 Lathe—16-0 centres—4-8 swing	400
14 Radial drill—5 ft. swing	2,200
15 Chuck, 6-0 centres 10 in. swing	200
16 Shaper, 2-0 travel	600
17 " " 1-4 "	375
18 Large planer 19-0 x 7-0	4,000
19 Lathe 4-6 centres 18 in. swing (gap lathe)	500
20 " " 7-0 " 18 "	650
21 " " 6-6 " 16 "	600
22 " " 4-6 " 19 "	500
23 " " 6-6 " 21 "	700
24 " " 8-0 " 30 " gap	1,200
25 " " 10-0 " 24 "	600
26 " " 4-6 " 14 "	300
27 " " 4-6 " 13 "	400
28 " " 20-10 " 23 "	1,200
29 4 Spindles drill	2,000
30 Cold saw, hack	30
31 Automatic cold saw, 18 in. dia., portable	50
32 Small planer 8-6 x 2-7	600
33 No. 2 Leblond milling machine	800
34 Drill 2-6	300
35 Lathe, gap 11-0 x 18 in.	600
37 Turret lathe 17 in. swing	800
38 Lathe 6-0 centres 18 in. swing (chuck)	2,000
39 Drill, 3-4 face plate	400
40 Chuck, 6-0 centres	2,000
41 1 Slotting machine	300
42 Travelling crane and blocks	500
43 Shafting and belting	1,000
44 Miscellaneous tools and sundries	1,000
	\$ 35,255

OLD BOILER SHOP NO. 3.

Shears No. 1, 51 in. gap	700
Punch No. 2, 48 "	700
Punch and shears No. 3, 37 in. gap	500
Plate rolls 8, outside 10-0 in. dia.	500
Osk drill 9	300
Small set slabs and forge and crane 10-0 x 7-0	100
Large " " " 50-0 x 30-0	1,500
1 Plate furnace 20-0, 1 fire 5-6 x 2-2 door	1,000
1 Angle " 40-0, 2 " 2-6 x 1-0 "	1,000
1 Cold saw	50
Shafts, belts, &c.	200
Miscellaneous tools	500
" " in mould loft	150
	\$ 7,900

NEW BOILER SHOP NO. 2.

No. 1 Angle shears, double	1,000
2 Punch horizontal	800
3 Countersinking drill	800
4 " " "	600
5 Drill radial	750
6 Plate bending rolls—12-0 x 20 in. dia.	6,000
7 Air compressor 12 x 14 x 12	600
8	
9 Bending rolls, hand power—small	50
10 Forge, boilermakers	50

3 GEORGE V., A. 1913

SOREL SHIPYARD—APPROXIMATE VALUATION OF PLANT AT MARCH 15, 1912—Con.

NEW BOILER SHOP NO. 2—Continued.

11 "C" pressure blower fan.....	\$ 60
12	
13	
14	
15 Hydraulic beam shears.....	2,500
16 Punching machine—48 in. gap.....	1,000
17 " " old machine (27 in. gap).....	300
18 Drill (old).....	200
19 Hydraulic pumps.....	800
20 Shears 48 in. gap.....	1,000
21	
22 Head drill.....	800
23	
24 Drill—good radial.....	500
25 Emery wheel.....	100
26 Punching machine 48 in. gap.....	1,500
27 " " ".....	1,500
28 Plate planer.....	1,200
29 Hydraulic coping machine.....	500
30 Two 5 ton travelling cranes.....	1,500
31 One 30 ton ".....	3,000
32 One air lift 3 tons.....	100
Shafting and belting.....	300
Miscellaneous tools and sundries.....	900
1 Wells light.....	100
	<hr/>
	\$ 28,400

SHOP OVER SAW-MILL.

No. 1 Wood lathe 15-0 long x 20 in. diameter.....	\$ 100
2 Wood planer—revolving table—24 in. knife.....	300
3 Circular saw.....	100
4 Band saw 3-6 in. diameter wheel.....	150
5 Buzz planer 25 in. knife.....	150
6 Tencning machine 18 in. x 4-0.....	250
7 Boring machine.....	50
8 Grindstone 21 in. diam.....	10
9 Mortice machine.....	400
10 Sand papering machine.....	25
11 Saw sharpening tools.....	50
Forge 2-0 x 2-0.....	25
Rolls for straightening bandsaws.....	25
Emery wheel 12 x 7.....	15
" " 12 double head.....	20
" " special.....	50
Band saw sharpening machine.....	60
Shafting and belts.....	50
Miscellaneous tools and sundries.....	250
	<hr/>
	\$ 2,070

TINSMITH SHOP.

1 small beading machine.....	\$ 20 00
1 " burring ".....	60 00
2 " punch 12 in. gap.....	160 00
1 set rolls 36 in. (stove pipe).....	100 00
1 36 in. foot shears.....	75 00
1 14 in. circular burring machine.....	50 00
1 36 in. plate folder.....	25 00
1 21 in. ".....	20 00
1 small turning machine.....	100 00
2 10 in. gap shears.....	50 00
1 large turning machine.....	75 00
1 wiring ".....	50 00
1 setting down machine.....	20 00
1 soldering iron furnace (no use).....	
Hand tools, benches, vices and miscellaneous tools.....	200 00
	<hr/>
	\$ 945 00

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SOREL SHIPYARD—APPROXIMATE VALUATION OF PLANT AT MARCH 15, 1912—Con.

SAWMILL

Value of buildings.....	\$ 500 00
No.	
1 Moulding machine, 4 sides, 12 in. x 6 in.....	800 00
2 Band saw, small.....	150 00
3 Planer and matcher 24 in. x 6 in.....	300 00
4 Planer, revolving table, 26 in. x 10 in.....	100 00
5 Travelling log carrier 60.0 x 36 ft. x 36 in.....	1,500 00
6 Circular saw 60 in. diameter.....	500 00
7 Band saw, 9 in. wide 72 in. wheel.....	800 00
8 Timber hauling out ways, endless chain, etc.....	1,500 00
9 Swing saw 36 in. diameter.....	300 00
10 Edger saw 18 in. ".....	500 00
11 Swing saw 16 in. ".....	150 00
12 Small emery wheel 11 in. diameter.....	50 00
13 Grindstone 36 in. diameter.....	15 00
14 Fan exhaust for shavings 36 in. and pipes.....	300 00
15 Shafting and pulleys and belts.....	800 00
16 Sundry tools.....	200 00

\$ 7,965 00

BLACKSMITH SHOP.

1 large steam hammer.....	\$ 500 00
1 medium ".....	300 00
1 electric hammer.....	1,200 00
1 small electric hammer.....	150 00
1 blower.....	60 00
11 fires.....	250 00
3 cranes.....	200 00
1 weighing machine.....	25 00
Vices, hand tools, crasses, steam piping.....	500 00

\$ 3,185 00

PATTERN SHOP (over machine shop).

1 Wood lathe.....	\$ 75 00
2 ".....	75 00
3 Band saw.....	150 00
4 Surface planes.....	175 00
5 Buzz planes.....	150 00
6 Band saw.....	150 00
7 Grindstone.....	10 00
8 ".....	10 00
Miscellaneous tools and sundries.....	205 00
Patterns throughout the yard.....	20,000 00

\$21,000 00

YARD.

Value of land, 43,560 sq. ft., 1 x 14 acres, 609,840 sq. ft., at 5½c. (does not include waste land or McCarthy Estate).....	\$ 33,540 00
Value of industrial railway (1 mile) 1,875 yds. at \$2.50, \$4,687; 27 curves at \$6, \$4,849.....	4,800 00
" steam piping, 4,000 sq. ft. heating surface at 22c.....	1,500 00
" water piping.....	3,000 00
" air piping.....	1,500 00
Winch, electric (large).....	6,000 00
" " (small).....	2,000 00
Sewers.....	500 00
Fire protection (reels and hose).....	1,000 00
Weighing machine.....	300 00
No. 2 fire hold, 3 locomotive boilers.....	3,000 00
1 30-ton hand crane.....	2,500 00
Shear legs, new, 18,000 lbs, 12,000 winch, &c.....	30,000 00
" old.....	800 00
Fencing.....	500 00
Wharfs, 4 off.....	8,000 00
Marine railway, No. 1, 12,000, and No. 2, 7,500.....	8,700 00
Wires and blocks, tools and implements.....	1,250 00
11 horses, harness and equipment.....	2,500 00
Wagons, sleighs, and industrial cars.....	1,500 00
Boats and punts.....	200 00
Shelters, 12 off., windshields.....	200 00
Steaming trough for carpenters.....	100 00

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SOREL SHIPYARD—APPROXIMATE VALUATION OF PLANT AT MARCH 15, 1912—*Con.*YARD—*Continued.*

Shear legs, derrick posts, &c.....	\$	500 00
Sundries		500 00
Furniture and fixings.....		1,000 00
Miscellaneous tools.....		710 00
Carpenter shop		400 00
	\$	116,500 00

STEAMFITTER'S SHOP.

1 small hand forge.....	\$	25 00
1 pipe machine, 1-in. to 6-in. screwing.....		200 00
1 " " 2-in. to 8-in. ".....		600 00
2 small hand pipe machines, up to 2-in.....		50 00
2 12 in. upright drill.....		100 00
1 combined buffer and emery grinder.....		75 00
1 V elsbach light.....		100 00
Hand dies, miscellaneous tools, shafting, belts, &c.....		600 00
2 pipe bending machines.....		50 00
Stabs for bending pipes on.....		50 00
Miscellaneous tools.....		2,000 00
	\$	3,850 00
New mould loft.....	\$	220 00
Paint shop		350 00
Asbestos		100 00
	\$	670 00

ELECTRICAL DEPARTMENT.

Air compressor, 12 x 19 x 18.....	\$	1,500 00
1 125-h.p., 110 volt, direct current motor.....		1,000 00
300-h.p. alternating current, 2 phase, 2,200 volt motor.....		1,000 00
1 200-k.w., 125 volt, 1,600 amperes, direct current generator.....		4,500 00
1 switch board and equipment.....		750 00
Wiring posts, &c.....		2,500 00
Telephones.....		350 00
2 75-k.w. transformers, 2,200, 440 volts.....		1,000 00
1 50-k.w. " " 2,200, 440 ".....		750 00
2 30-k.w. " " 2,200, 440 ".....		600 00
2 15-k.w. " " 2,200, 110, 220.....		700 00
2 10-k.w. " " 2,200, 220.....		175 00
2 15-k.w. " " 2,200, 220.....		250 00
40 direct current arc lamps.....		600 00
3 alternating current arc lamps.....		40 00
1,000 incandescent lights, 16 c.p., and wiring.....		800 00
1 150 incandescent, alternating current, 440 volt motor sawmill.....		1,200 00
1 100 " " " 440 " " ".....		700 00
1 5 " " direct " 440 " " ".....		100 00
2 30 " " alternating " 440 volts motor pumps.....		600 00
1 25 " " " " 440 volts motor plate rolls.....		300 00
1 7 1/2 " " " " 440 " " ".....		200 00
1 10 " " " " 220 " boiler shop.....		250 00
1 10 " " " " 220 " " ".....		250 00
1 10 " " direct " 110 volts boiler shop.....		200 00
1 10 " " " " 110 " " ".....		200 00
1 5 " " " " 110 air tools, boiler shop.....		100 00
1 15 " " " " 110 steamfitter.....		300 00
1 25 " " " " 110 boiler shop.....		500 00
1 10 " " " " 110 " " ".....		200 00
1 10-h.p. direct current 110 volts motor, boiler shop.....		200 00
1 20-h.p. " " " " ".....		400 00
1 40-h.p. " " " " air compressor, boiler shop.....		750 00
1 5-h.p. " " " " ".....		100 00
1 10-h.p. " " " " ".....		200 00
1 15-h.p. " " " " ".....		250 00
1 10-h.p. " " " " ".....		200 00
2 10-h.p. " " " " motor.....		350 00
1 3-h.p. " " " " blacksmith.....		90 00
1 13-h.p. " " " " ".....		250 00
1 10-h.p. " " " " ".....		200 00
1 55-h.p. " " " " machine shop.....		500 00
Call bells.....		50 00

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SOREL SHIPYARD—APPROXIMATE VALUATION OF PLANT AT MARCH 15, 1912—Con.

ELECTRICAL DEPARTMENT—Continued.

175-h.p. 110 volt direct current motor winch.....	\$	700 00
16-h.p. " " " spare.....		100 00
1 1/2-h.p. " " " ".....		40 00
150 k.w. generator and engine (old engine room).....		1,200 00
130 k.w. " " " ".....		800 00
125 k.w. 110 volt direct current motor (old winch).....		200 00
2500 g.p.m. double stage centrifugal pump.....		1,300 00
1500 g.p.m. steam driven underwriters pump and hose.....		800 00
1 tee-1 water heater.....		50 00
1 boiler feed pump.....		75 00
1 20-h.p. Corliss engine.....		300 00
1 switchboard.....		200 00
1 12 x 12 x 14 steam driven air compressor.....		1,000 00
3 return tubular boilers.....		3,000 00
Miscellaneous tools.....		475 00
	\$	34,900 00

PNEUMATIC TOOLS.

18 L.S. hammers, 90 x 1 1/4 x 6, at \$80 each.....	\$	1,440 00
2 L.S. hammers, 90 x 1 1/4 x 6, special.....		250 00
4 L.S. hammers, 60 x 1 1/4 x 6.....		300 00
13 chipping hammers, No. 2, at \$50 each.....		650 00
5 drills, No. 1.....		400 00
22 drills, No. 2, at \$75 each.....		1,650 00
4 drills, No. 3, at \$60 each.....		240 00
1 drill, wood boring, No. 5.....		100 00
2 drills, corner boring, No. 2.....		300 00
1 flue expander, No. 11.....		100 00
16 holders.....		480 00
2 painting machines.....		40 00
2 three-ton air hoists.....		820 00
1 No. 2 Whitelaw bolt nipper.....		225 00
2 yoke riveters, 1 1/4 x 6.....		200 00
2 compression riveters.....		250 00
1 rivet buster.....		100 00
Shafting.....		50 00
Belts and pulleys.....		20 00
Miscellaneous tools.....		300 00
	\$	7,410 00

BUILDINGS.

No. 2. Boiler shop (new).....	\$	20,000
3. " (old).....		4,000
4. Offices and stores.....		5,000
5. Machine shop and pattern shop—No. 1 fire hold.....		20,000
6. Blacksmith shop.....		800
7. Wire ropes and iron and wood store.....		2,000
8. Stables and sto. 1.....		2,000
9. Carpenters shop (spar shed).....		1,200
10. Ice house.....		800
11. Rivet store.....		1,000
12. Rivet and nail store.....		1,000
13. Manilla shed.....		600
14. Oil shed.....		600
15. Fleet storehouse.....		7,800
16. Power house.....		10,000
17. Sawmill and joiner shop.....		15,000
18. Paint shop, mould loft and asbestos department.....		10,000
19. Pattern shed.....		5,000
20. Dry wood store.....		1,000
21. Fire hold No. 2.....		3,500
22. Shed for castings and platform.....		2,500
23. Dry kiln (includes pipes).....		3,000
24. Machinery shed (storing new machines).....		2,000
25. Angle iron smith shed.....		100
26. New Ways 'Winch House'.....		400
27. Platform 'Scale House' 'Weighing Machine'.....		300
28. Fire reels shed.....		300
29. Old winch house (no use).....		50
30. Oakum house.....		100
31. 40 ton shear leg winch house.....		400

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SOREL SHIPYARD—APPROXIMATE VALUATION OF PLANT AT MARCH 15, 1912—*Con.*BUILDINGS—*Continued.*

No. 32. Repairing shop for launches.....	\$	200
33. Shed for stowing launches.....		150
34. House for iron stock-keeper.....		60
Water closets (double).....		250
Water closets (single).....		200
	\$	121,310

RECAPITULATION.

Machine shop.....	\$	35,255
Old boiler shop.....		7,300
New boiler shop.....		28,400
Joiners shop.....		2,070
Tinsmiths shop.....		945
Sawmill.....		7,965
Blacksmith shop.....		3,185
Pattern shop.....		21,000
Yard.....		116,500
Steamfitters shop.....		3,850
Electrical department.....		34,900
Pneumatic tools.....		7,415
Buildings.....		121,310
Miscellaneous drawing models, &c.....		10,560
New mould loft paint shop and asbestos shop, and miscellaneous tools.....		670
	\$	401,325
Stock to add.....		303,133
Grand total.....	\$	704,458

NOTES.

The boiler makers and shipbuilding departments ought to be under separate and distinct responsible foremen as the trades are totally different and have little or nothing in common with each other.

The average rate of wages paid is rather low in comparison with other Canadian yards and engineering workshops, probably due to the fact that the men are not properly qualified tradesmen. If this is the case then the excessive cost is somewhat explained, because good tradesmen will not work at the rates paid at Sorel just now. To pay even low rates of wages to inferior workmen is not good business; far better to get first class tradesmen and pay them accordingly (at least leading hands). We do not advocate a general rise in wages. The whole wages question requires to be looked very carefully into; perhaps in many cases the men are being paid more than they are worth.

Some system wants to be inaugurated to keep track of the amount of coal consumed; the initial cost, cost of haulage, supplies to fleet, &c.

Miscellaneous Tools.—After stock of these has been taken and valuation made of the tools in each department, they should all be returned to the store, and on a requisition from the foreman as many as are necessary, to carry on the work given out, and a proper inventory kept both in the store and the shops. This would simplify matters at stock taking time, as these tools are always being added to as they get worn out and so forth.

We checked several steel invoices and found the rolling margin to run from 3 per cent to 1½ per cent over calculated weight, which is fair and reasonable, but this wants to be attended to.

Messrs. Price, Waterhouse & Co. have overhauled the timekeeping and will doubtless report to the Commission, therefore we will not add any more to our remarks on this subject.

When stock taking is finished we would suggest that the stock is checked with the stock books to see how they tally.

SESSIONAL PAPER No. 57

STATEMENT OF SHOP EXPENSE FOR FISCAL YEAR 1908-09--THE DEPARTMENT OF MARINE AND FISHERIES--GOVERNMENT SHIP YARD, SOREL PREPARED BY THE COST DEPARTMENT, APRIL, 1909.

ASBESTOS DEPARTMENT.

Wages of foremen and sundry help, not distributed.....	\$	139 31
Power, heat and light		568 60
Properties of non-producing departments.....		435 19
Building repairs		265 81
Machine shop.....		15 20
Teamsters and horses.....		6 72
Pipe shop.....		2 70
Yard.....		1 83
Stores.....		37 05
	\$	<u>1,472 34</u>

	1907-08	1908-09
The amounts of direct wages were.....	\$ 1,296 57	\$ 3,289 81
The indirect cost to be added to above.....	406 29	1,472 34
The percentages of indirect to direct.....	33 1/4 p.c.	44 1/2 p.c.

N. B.--Only 7 months in operation in 1907-08.

BLACKSMITH SHOP.

Wages of foreman, clerk and sundry help, not distributed.....	\$	2,629 71
Power, heat and light		1,255 00
Proportion of non-producing departments		1,347 70
Stores.....		1,019 35
Building repairs.....		797 42
Yard.....		73 95
Electrical shop		1 25
Machine shop.....		24 91
Saw mill.....		12 39
Teamsters and horses.....		12 72
Pattern shop.....		8 71
Shop sundries.....		434 04
	\$	<u>7,608 15</u>

	1907-08	1908-09
Direct wages were.....	\$ 10,762 45	\$ 10,345 55
Indirect cost to be added to above.....	7,993 10	7,608 15
Percentage of indirect to direct.....	74 1/4 p.c.	73 1/4 p.c.

BOILER SHOP.

Wages of foreman, clerk and sundry help, not distributed.....	\$	4,310 41
Power, heat and light		12,774 00
Proportion of non-producing departments		9,762 88
Stores.....		6,017 34
Building repairs.....		1,622 09
Blacksmith shop.....		1,895 76
Yard.....		560 68
Teamsters and horses.....		234 00
Electrical shop.....		773 81
Saw mill.....		65 70
Machine shop.....		53 31
Carpenter shop.....		20 27
Pattern shop.....		7 69
Shop Sundries.....		865 79
Pneumatic Tools--		
Machine shop.....	\$	762 72
Pipe shop.....		797 63
Stores.....		2,871 33
	\$	<u>4,431 13</u>
	\$	<u>43,505 12</u>

	1907-08.	1908-09.
Direct wages were.....	\$ 64,341 05	\$ 74,721 44
Indirect cost to be added to above.....	43,036 99	43,305 12
Percentage of indirect to direct.....	67 p.c.	58 p.c.

3 GEORGE V., A. 1913

STATEMENT OF SHOP EXPENSE FOR FISCAL YEAR 1906-07, &c.—Con.

CARPENT SHOP.		\$	cts.
Wages of foreman, clerk, not distributed		290	44
Power, heat and light		1,966	50
Proportion of non-producing departments		496	54
Building repairs		181	67
Stores		133	87
Saw mill		196	43
Electrical shop		98	57
Shop sundries		29	24
		\$	3,424 79
	1907-06.	\$	cts.
Direct wages, were	2,026 96	2,742	56
Indirect cost to be added to above	3,975 95	3,626	19
Percentage of indirect to direct	18 1/2 p.c.	62	p.c.

CARPENTER SHOP.		\$	cts.
Wages of foreman, clerk, not distributed		1,439	65
Power, heat and light		74	50
Proportion of non-producing departments		4,554	00
Building repairs		105	81
Stores		163	66
Blacksmith shop		16	06
Saw mill		29	42
Machine shop		1	61
		\$	6,864 42
	1907-06.	\$	cts.
Direct wages were	28,946 62	24,481	53
Indirect cost to be added to above	7,199 00	6,864	42
Percentage of indirect to direct	25 p.c.	29	p.c.

PAINTERS.		\$	cts.
Proportion of non-producing departments		1,170	49
Paint shop		88	56
Pipe shop		2	86
Store		64	56
		\$	1,821 25
	1907-06.	\$	cts.
Direct wages were	7,721 84	9,053	20
Indirect cost to be added to the above	1,628 44	1,821	25
Percentage of indirect to direct	22 p.c.	24	p.c.

DRAUGHTING.		\$	cts.
Salaries of chief draughtsman and office help		2,112	44
Proportion of non-producing departments		1,087	75
Power, heat and light		82	50
Stores		78	85
Sundries		32	54
		\$	3,823 20
	1907-06.	\$	cts.
Direct salaries were	4,888 76	7,885	26
Indirect cost to be added to above	4,387 78	3,823	20
Percentage of indirect to direct	90 1/2 p.c.	42	2-50 p.c.

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STATEMENT OF SHOP EXPENSE FOR FISCAL YEAR 1908-09, &c.—Con.

ELECTRICAL DEPARTMENT.

Wages of foreman, clerk, not distributed	\$	cts.
Power, heat and light	903	20
Proportion of non-producing departments	412	25
Building repairs	256	99
Stores	102	51
Carpenter shop	64	20
	43	01
	<hr/>	
	1,882	16

	1907-08.	1908-09.
Direct wages were	\$ cts.	\$ cts.
Indirect cost to be added to above	3,609 39	2,715 70
Percentage of indirect to direct	2,150 45	1,832 16
	69 p.c.	69 p.c.

MOULD LOFT.

Proportion of non-producing departments	\$	cts.
Power, heat and light	968	06
Building repairs	2,174	75
Stores	76	36
Saw mill	094	09
Yard	790	04
Teamsters and horses	68	81
Shop sundries	24	97
	19	44
	<hr/>	
	4,919	22

	1907-08.	1908-09.
Direct wages were	\$ cts.	\$ cts.
Indirect cost to be added to above	7,367 80	7,506 19
Percentage of indirect to direct	3,702 48	4,919 22
	50½ p.c.	65½ p.c.

MACHINE SHOP.

Wages of foreman, clerk and sundry help not distributed	2,173	66
Power, heat and light	3,287	25
Proportion of non-producing departments	3,885	86
Building repairs	1,502	50
Stores	1,200	65
Blacksmith shop	529	59
Yard	530	55
Electrical shop	164	56
Pattern shop	27	94
Teamsters and horses	13	03
Shop sundries	445	39
	<hr/>	
	13,751	80

	1907-08.	1908-09.
Direct wages were	\$ cts.	\$ cts.
Indirect cost to be added to above	23,357 67	29,890 01
Percentage of indirect to direct	14,007 24	13,751 80
	60 p.c.	46 p.c.

PAINT SHOP.

Wages of foreman, clerk, not distributed	\$	cts.
Power, heat and light	1,474	42
Proportion of non-producing departments	700	75
Building repairs	2,504	26
Stores	217	82
Blacksmith shop	85	84
Teamsters and horses	16	77
Shop sundries	11	51
	110	89
	<hr/>	
	5,122	26

	1907-08.	1908-09.
Direct wages were	\$ cts.	\$ cts.
Indirect cost to be added to above	16,790 01	19,449 60
Percentage of indirect to direct	4,683 13	6,122 26
	28 p.c.	26½ p.c.

STATEMENT OF SHOP EXPENSE FOR FISCAL YEAR 1908-09, &c.—Con.

PATTERN SHOP.		\$ cts.	
Wages of foreman, clerk, not distributed	1,680	10	
Power, heat and light	1,342	25	
Proportion of non-producing departments	750	44	
Stores	600	84	
Building repairs	716	07	
Saw mill	159	20	
Yard	109	67	
Teamsters and horses	15	40	
Shop sundries	58	84	
			5,432 85
	1907-08.	1908-09.	
	\$ cts.	\$ cts.	
Direct wages were	5,512 29	5,726 51	
Indirect cost to be added to above	5,547 60	5,432 85	
Percentage of indirect to direct	99 p.c.	95 p.c.	
PIPE SHOP.		\$ cts.	
Wages of foreman, clerk, not distributed	1,209	24	
Power, heat and light	986	75	
Proportion of non-producing departments	1,275	94	
Stores	316	16	
Machine shop	7	98	
Electrical shop	23	23	
Blacksmith shop	1	67	
Building repairs	13	84	
Shop sundries	27	40	
			3,952 21
	1907-08.	1908-09.	
	\$ cts.	\$ cts.	
Direct wages were	10,787 43	9,712 76	
Indirect cost to be added to above	5,041 78	3,952 21	
Percentage of indirect to direct	47 p.c.	40½ p.c.	
YARD.		\$ cts.	
Wages of foreman, clerk, not distributed	1,888	51	
Proportion of non-producing departments	3,585	63	
Building repairs	108	33	
			5,582 47
	1907-08.	1908-09.	
	\$ cts.	\$ cts.	
Direct wages were	24,745 15	27,694 13	
Indirect cost to be added to above	4,906 73	5,582 47	
Percentage of indirect to direct	20 p.c.	20 p.c.	
SAW MILL.		\$ cts.	
Wages of foreman, clerk, not distributed	1,147	44	
Power, heat and light	5,349	75	
Proportion of non-producing departments	963	23	
Stores	832	17	
Building repairs	805	17	
Electrical shop	352	71	
Yard	471	82	
Teamsters and horses	115	49	
Pattern shop	16	40	
Machine shop	22	82	
Blacksmith shop	37	57	
Cabinet shop	2	48	
Carpenter shop	2	55	
Shop sundries	664	17	
			10,783 77

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STATEMENT OF SHOP EXPENSE FOR FISCAL YEAR 1908-09, &c.—*Con.*

SAW MILL—*Continued.*

	1907-08.	1908-09.
	\$ cts.	\$ cts.
Direct wages were	6,123 10	7,290 21
Indirect cost to be added to above	12,748 22	10,783 77
Percentage of indirect to direct	208 p.c.	147½ p.c.

GENERAL EXPENSE.

	\$ cts.
Staff salaries	4,016 62
Rent	1,200 00
Power, heat and light, including deficit of \$1,439.53 in P. H. & L. account	5,513 03
Office salaries: Superintendent and time keeper	2,536 52
Building repairs	1,048 19
Yard	3,508 30
Teamsters and horses	841 83
Stores	1,863 93
Travelling and moving expenses: Mess. Desbarats, Papineau, Baril and Terrecault	173 92
Gasoline launches: <i>Bronx</i> , \$140.72; <i>Buffalo</i> , \$192.49; <i>Viator</i> , \$86.24	419 45
Water works	947 76
Wharves	670 60
Reception of Sept. 5, 1903	723 81
Locating St. Joseph cemetery	62 62
Repairs and maintenance of S. Y. railway	1,299 57
Repairs to scale	312 35
Stationery	560 71
Fences	322 51
Time records	365 80
Shear legs	107 57
Telephones	182 16
Telegrams	18 23
Postage stamps	100 63
Blacksmith shop	72 59
Saw mill	81 27
Coal delivered and not charged during the year	777 20
Sundries	260 35
Deficit in stables account	668 14
	<hr/>
	28,654 93
Less—Surplus of ways account, \$786.48; diff. with pay rolls during the year, \$33.61	820 09
	<hr/>
	27,834 84

	1907-08.	1908-09.
	\$ cts.	\$ cts.
General expense account	24,996 84	27,834 84

OFFICE EXPENSE.

	\$ cts.
Salaries of clerks	1,661 99
Cleaning	190 50
Stores	133 65
	<hr/>
	1,986 14

	1907-08.	1908-09.
	\$ cts.	\$ cts.
Office expense account	1,944 04	1,986 14

COST DEPARTMENT.

	\$ cts.
Salaries of Cost Clerk and assistants	2,452 11

	1907-08.	1908-09.
	\$ cts.	\$ cts.
Cost department account	1,876 24	2,452 11

PROTECTION.

	\$
Wages of watchmen	3,213 60
Less—½ charged to Fleet, Gen. Exp.	2,410 25
	<hr/>
	\$ 803 35

	1907-08.	1908-09.
	\$	\$
Protection acct.	782 40	803 35

STATEMENT OF SHOP EXPENSE FOR FISCAL YEAR 1908-09, &c.—*Con.*

STABLES.

Wages of stablemen	\$	1,203	81
Stores		1,236	86
Wagon repairs		1,490	29
Building repairs		282	85
Blacksmith shop		78	14
Electrician shop		25	25
Power, heat and light		10	35
Sundries			
	\$	4,327	55

	1907-08.	1908-09.
Stables acct	\$ 4,474 98	\$ 4,327 55

STORE EXPENSE.

Salaries of store-keeper and assistants	\$	7,175	65
Yard		7,030	14
Teamsters and horses		2,315	03
Building repairs		1,104	96
Power, heat and light		457	59
Stores		282	74
Machine shop		223	88
Asbestos department		28	64
Cabinet shop		23	35
Drafting		19	73
Saw mill		14	59
Pattern shop		8	41
Sundries		209	20
	\$	18,892	96

	1907-08.	1908-09.
Store expense acct	\$ 15,699 51	\$ 18,892 96

POWER, HEAT AND LIGHT.

Boiler rooms:—

Firemen—Fire hold No. 1	\$	1,847	95
" " 2		429	02
	\$	2,276	98
Teamsters and horses		1,112	77
Building repairs		291	64
Boiler and steam pipes, repairs		901	77
Stores		305	98
Yard		250	75
Fuel—Coal	\$	7,809	62
Slabs		1,181	62
	\$	8,991	14

Power house:—

Sorel Electric Co	\$	17,374	54
F. A. Cote, salary		1,516	66
Electricians		2,534	59
Stores—Power house		407	88
Electric light		227	24
		635	12
Building repairs		311	36
Repairs to air pipes and compressor		270	25
Change of voltage and wire poles		221	62
Sundries		211	96

		23,106	10
	\$	37,247	13

Power, heat and light acct:—

	1907-08.	1908-09.
Boiler rooms	\$ 11,691 67	\$ 14,141 03
Power house	22,905 29	23,106 10
	\$ 34,596 96	\$ 37,247 13

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STATEMENT OF SHOP EXPENSE FOR FISCAL YEAR 1908-09, &c.—*Con.*

SAWING.

Raw Material.	Dr.		Product.	Cr.
	\$ cts.	\$ cts.		\$ cts.
White pine—				
85,567 cu. ft.	25,655	30		
4,444 ft. b. m.	199	98		
514 lin. ft.	104	09		
		25,959	37	640,94 ft. b. m.
Hemlock—				31,365 14
5,259 lin. ft.	985	86		
855 ft. b. m.	15	39		
		1,001	25	25,957 "
Spruce—				767 56
131 lin. ft.	24	56		
239 ft. b. m.	9	56		
		33	92	4,508 "
British Columbia fir—				166 72
3,684 ft. b. m.		165	78	3,437 "
Elm—				206 22
123,683 ft. b. m.		5,665	75	117,095 "
White ash—				7,002 61
890 ft. b. m.		29	38	346 "
Oak—				17 30
2,632½ cu. ft.	1,803	94		
127 lin. ft.	42	13		
		1,846	07	31,083 "
Teak wood—				1,992 58
458 ft. b. m.		75	57	413 "
				63 15
Slabs				1,497 00
Red pine—				
133,665 ft. b. m.		5,482	63	127,158 ft. b. m.
				7,629 48
Labour.		40,159	72	950,941 "
Direct.	3,622	92		
Indirect.	5,285	26		
		8,908	18	
Surplus.	2,525	66		
Less amount omitted in W. pine in 1907-08	890	80	1,634	86
		50,702	76	50,702 76

STATEMENT OF SHOP EXPENSE FOR FISCAL YEAR 1908-09, &c.—Con.

RECAPITULATION.

	1907-08.			1908-09.		
	Direct.	Indirect.	Per-centage.	Direct.	Indirect.	Per-centage.
	\$ cts.	\$ cts.		\$ cts.	\$ cts.	
Asbestos department.....	1,296 57	406 29	31½	3,289 81	1,472 34	44½
Blacksmith shop.....	10,762 45	7,993 10	74½	10,345 55	7,608 15	73½
Boiler shop.....	64,341 05	43,036 99	67	74,721 44	43,305 12	58
Cabinet shop.....	3,026 98	3,976 98	131½	3,742 56	3,438 19	92
Carpenter shop.....	28,995 62	7,199 00	25	34,431 33	6,364 43	18½
Caulkers.....	7,721 84	1,658 44	22	9,013 90	1,331 39	14½
Draughting.....	6,934 76	4,267 78	61½	7,836 36	3,313 89	42½
Electrical.....	3,609 39	2,150 45	60	2,716 70	1,882 16	69
Mould loft.....	7,367 80	3,702 48	50½	7,506 19	4,919 22	65½
Machine shop.....	23,357 67	14,007 24	60	29,860 04	13,751 80	46
Paint shop.....	16,790 01	4,683 13	28	19,449 60	5,122 26	26½
Pattern shop.....	5,512 29	5,447 60	99	5,726 51	5,432 85	95
Pipe shop.....	10,787 43	5,041 78	47	9,712 76	3,952 21	40½
Yard.....	24,745 15	4,906 73	20	27,694 13	5,582 47	20
Saw mill.....	6,123 10	12,748 22	208	7,299 21	10,783 77	147½
	221,372 11	121,226 21		253,345 09	118,200 16	

Average percentage of all shops together (except teamsters and sawing) :—

1907-08..... 54½ p.c.; 1908-09..... 46½ p.c.

But to arrive at a fair comparison with previous fiscal year it is necessary to add 7½ per cent to all percentages of 1908-09, as stores expense account was not included in the non-producing departments in 1908-09 while it was in 1907-08.

STATEMENT OF SHOP EXPENSE FOR FISCAL YEAR 1909-10.—THE DEPARTMENT OF MARINE AND FISHERIES.—GOVERNMENT SHIPYARD, SOREL.—PREPARED BY THE COST DEPARTMENT, APRIL, 1910.

ASBESTOS DEPARTMENT.

Wages of foreman and sundry help, not distributed.....	\$	27 98
Power, heat and light.....		600 00
Proportion of non-producing departments.....		561 39
Stores.....		38 15
Building repairs.....		74 72
Saw mill.....		6 36
Pipe shop.....		5 68
Shop sundries.....		212 70

\$ 1,527 18

	1907-08	1908-09	1909-10
Direct wages were.....	\$ 1,296 57	\$ 3,289 81	\$ 5,791 03
Indirect cost to be added to above.....	406 29	1,472 34	1,527 18
Percentage of indirect to direct.....	31½ p.c.	44½ p.c.	26½ p.c.

N. B.—Only 7 months in operation in 1907-08.

BLACKSMITH SHOP.

Wages of foreman and sundry help, not distributed.....	\$	3,060 91
Power, heat and light.....		1,332 00
Proportion of non-producing departments.....		1,319 71
Stores.....		2,314 18
Building repairs.....		403 94
Machine shop.....		181 29
Electrical shop.....		95 79
Yard.....		87 89
Teamsters.....		20 98
Shop sundries.....		568 97

\$ 9,373 61

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STATEMENT OF SHOP EXPENSE FOR FISCAL YEAR 1909-10, &c.—*Con.*

BLACKSMITH SHOP—*Continued.*

	1907-08	1908-09	1909-10
Direct wages were.....	\$ 10,762 45	\$ 10,345 55	\$ 13,521 44
Indirect cost to be added to above.....	7,993 10	7,668 15	9,375 61
Percentage of indirect to direct.....	74½ p.c.	73½ p.c.	69,5¼ p.c.

BOILER SHOP.

Wages of foreman and sundry help, not distributed.....	\$	4,485 04
Power, heat and light.....		13,488 00
Non-producing departments.....		7,997 06
Stores.....		5,059 80
Building repairs.....		1,024 38
Blacksmith shop.....		1,831 13
Yard.....		750 80
Teamsters.....		277 00
Machine shop.....		213 36
Electrical shop.....		637 61
Carpenter shop.....		15 88
Shop sundries.....		898 78
Pneumatic tools:—		
Machine shop.....	\$	742 77
Pipe shop.....		36 12
Maintenance of air hose.....		729 33
Stores.....		2,162 85
		<u>3,670 97</u>
	\$	<u>40,349 81</u>

	1907-08	1908-09	1909-10
Direct wages were.....	\$ 64,341 05	\$ 74,721 44	\$ 83,204 27
Indirect cost to be added to above.....	43,056 99	43,305 12	40,349 81
Percentage of indirect to direct.....	67 p.c.	58 p.c.	48½ p.c.

CABINET SHOP.

Wages of foreman and sundry help, not distributed.....		378 37
Power, heat and light.....		2,082 00
Yard.....		55 56
Proportion of non-producing departments.....		335 18
Teamsters.....		22 04
Saw mill.....		307 40
Building repairs.....		21 74
Electrical shop.....		124 61
Shop sundries.....		124 57
Stores.....		132 40
		<u>\$ 3,584 07</u>

	1907-08	1908-09	1909-10
Direct wages were.....	\$ 3,026 93	\$ 3,742 56	\$ 3,451 47
Indirect cost to be added to above.....	3,976 98	3,438 19	3,584 07
Percentage of indirect to direct.....	131½ p.c.	92 p.c.	35,5¼ p.c.

N. B.—The decrease of percentage in 1909-10 is explained by the fact of the wood-working departments, i.e. cabinet shop, carpenter shop, caulkers and saw mill, being under the charge of the same foreman, closely related to each; a uniform percentage was calculated for the above mentioned departments.

CARPENTER SHOP.

Wages of foreman and sundry help, not distributed.....	\$	1,449 85
Power, heat and light.....		78 00
Proportion of non-producing departments.....		3,618 20
Stores.....		27 36
Saw mill.....		246 08
Blacksmith shop.....		46 87
Building repairs.....		12 55
Shop sundries.....		28 54
	\$	<u>5,707 45</u>

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STATEMENT OF SHOP EXPENSE FOR FISCAL YEAR 1909-10, &c.—*Con.*CARPENTER SHOP—*Continued.*

	1907-08.	1908-09.	1909-10
	\$ cts.	\$ cts.	\$ cts.
Direct wages were.....	28,995 62	34,431 33	37,712 67
Indirect cost to be added to above.....	7,199 00	6,864 43	5,707 45
Percentage of indirect to direct.....	25 p.c.	18½ p.c.	35 ¾ p.c.

N.B.—The increase of percentage in 1909-10 is explained by the fact that the woodworking departments, i.e. cabinet shop, carpenter shop, caulkers and saw mill, being under the charge of the same foreman, closely related to each other; a uniform percentage was calculated for the above-mentioned departments.

CAULKERS.

		\$ cts.
Proportion of non-producing departments.....		938 61
Shop sundries.....		4 59
		\$ 943 11

	1907-08.	1908-09.	1909-10
	\$ cts.	\$ cts.	\$ cts.
Direct wages were.....	7,721 84	9,013 90	9,773 20
Indirect cost to be added to above.....	1,658 44	1,331 39	943 11
Percentage of indirect to direct.....	22 p.c.	14½ p.c.	35 ¾ p.c.

N.B.—The increase of percentage in 1909-10 is explained by the fact that the woodworking departments, i.e. cabinet shop, carpenter shop, caulkers and saw mill, being under the charge of the same foreman, closely related to each other; a uniform percentage was calculated for the above-mentioned departments.

DRAUGHTING.

	\$ cts.
Wages of foreman and sundry help, not distributed.....	1,073 53
Proportion of non-producing departments.....	841 71
Power, heat and light.....	125 00
Stores.....	35 93
Sundries.....	63 64
	\$ 2,140 81

	1907-08.	1908-09.	1909-10
	\$ cts.	\$ cts.	\$ cts.
Direct wages were.....	6,934 76	7,836 36	8,674 92
Indirect cost to be added to above.....	4,267 78	3,313 80	2,140 81
Percentage of indirect to direct.....	61½ p.c.	42 ¾ p.c.	24 ⅙ p.c.

ELECTRICAL DEPARTMENT.

	\$ cts.
Wages of foreman and sundry help, not distributed.....	456 33
Power, heat and light.....	435 00
Proportion of non-producing departments.....	335 72
Stores.....	179 93
Building repairs.....	61 42
Carpenter shop.....	29 90
Shop sundries.....	20 18
	\$ 1,518 48

	1907-08.	1908-09.	1909-10.
	\$ cts.	\$ cts.	\$ cts.
Direct wages were.....	3,609 39	2,715 70	3,497 97
Indirect cost to be added to above.....	2,150 45	1,882 16	1,518 48
Percentage of indirect to direct.....	60 p.c.	69 p.c.	43 ⅘ p.c.

MOULD LOFT.

	\$ cts.
Proportion of non-producing departments.....	694 91
Power, heat and light.....	2,295 00
Stores.....	1,071 15
Building repairs.....	496 51
Saw mill.....	114 36
Yard.....	66 64
Teamsters.....	21 84
	\$ 4,670 41

	1907-08.	1908-09.	1909-10.
	\$ cts.	\$ cts.	\$ cts.
Direct wages were.....	7,367 80	7,506 19	7,179 42
Indirect cost to be added to above.....	3,702 48	4,919 22	4,670 41
Percentage of indirect to direct.....	60½ p.c.	65½ p.c.	65 ⅕ p.c.

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STATEMENT OF SHOP EXPENSE FOR FISCAL YEAR 1909-10, &c.—Con.

MACHINE SHOP.

	\$	cts.
Wages of foreman, clerk and sundry help, not distributed.....	2,620	70
Power, heat and light.....	3,471	00
Proportion of non-producing departments.....	3,891	98
Stores.....	1,942	28
Building repairs.....	545	19
Blacksmith shop.....	610	28
Electrical shop.....	218	94
Yard.....	202	03
Carpenter shop.....	134	97
Teamsters.....	40	32
Shop sundries.....	289	41
	\$	13,867
		10

	1907-08.	1908-09.	1909-10.
	\$	\$	\$
	cts.	cts.	cts.
Direct wages were.....	23,357	29,860	40,517
Indirect cost to be added to above.....	14,007	13,751	13,867
Percentage of indirect to direct.....	60 p.c.	46 p.c.	34'22 p.c.

PAINT SHOP.

	\$	cts.
Wages of foreman and sundry help, not distributed.....	1,525	67
Power, heat and light.....	741	00
Proportion of non-producing departments.....	2,124	93
Building repairs.....	148	89
Stores.....	67	83
Yard.....	42	21
Teamsters.....	17	26
Blacksmith shop.....	12	93
Saw mill.....	2	48
Shop sundries.....	187	89
	\$	4,871
		09

	1907-08.	1908-09.	1909-10.
	\$	\$	\$
	cts.	cts.	cts.
Direct wages were.....	16,790	19,449	22,650
Indirect cost to be added to above.....	4,683	5,123	4,871
Percentage of indirect to direct.....	28 p.c.	26'1 p.c.	21'66 p.c.

PATTERN SHOP.

	\$	cts.
Wages of foreman and sundry help, not distributed.....	2,128	21
Power, heat and light.....	1,071	00
Proportion of non-producing departments.....	579	04
Stores.....	510	08
Saw mill.....	286	80
Yard.....	69	79
Building repairs.....	92	89
Teamsters.....	20	59
Sundries.....	258	33
	\$	5,014
		73

	1907-08.	1908-09.	1909-10.
	\$	\$	\$
	cts.	cts.	cts.
Direct wages were.....	5,512	5,728	6,025
Indirect cost to be added to above.....	5,547	5,432	5,014
Percentage of indirect to direct.....	99 p.c.	95 p.c.	83'2' p.c.

PIPE SHOP.

	\$	cts.
Wages of foreman and sundry help, not distributed.....	1,477	78
Power, heat and light.....	1,041	00
Proportion of non-producing departments.....	1,123	45
Building repairs.....	413	32
Stores.....	296	88
Electrical shop.....	37	13
Blacksmith shop.....	6	37
Teamsters.....	3	00

STATEMENT OF SHOP EXPENSE FOR FISCAL YEAR 1909-10, &c.—*Con.*

PIPE SHOP— <i>Continued.</i>		\$ cts.
Machine shop.....		1 70
Saw mill.....		0 99
Shop sundries.....		101 93
		\$ 4,503 45

	1907-08. \$ cts.	1908-09. \$ cts.	1909-10. \$ cts.
Direct wages were.....	13,787 43	9,712 76	11,631 66
Indirect cost to be added to above.....	5,041 78	3,952 21	4,503 45
Percentage of indirect to direct.....	47 p.c.	40½ p.c.	39 71 p.c.

YARD.		\$ cts.
Wages of foreman and sundry help, not distributed.....		2,152 36
Proportion of non-producing departments.....		2,972 50
Building repairs.....		16 32
		\$ 5,141 18

	1907-08. \$ cts.	1908-09. \$ cts.	1909-10. \$ cts.
Direct wages were.....	24,745 15	27,694 13	31,445 43
Indirect cost to be added to above.....	4,906 75	5,582 47	5,141 18
Percentage of indirect to direct.....	20 p.c.	20 p.c.	16-35 p.c.

SAW MILL.		\$ cts.
Wages of foreman and sundry help, not distributed.....		709 69
Power, heat and light.....		5,649 00
Proportion of non-producing departments.....		666 48
Stores.....		590 61
Yard.....		1,235 16
Electrical shop.....		430 21
Machine shop.....		158 70
Building repairs.....		88 15
Teamsters.....		46 86
Blacksmith shop.....		14 33
Carpenter shop.....		5 69
Pipe shop.....		1 75
Shop sundries.....		676 86
		\$ 10,172 93

	1907-08. \$ cts.	1908-09. \$ cts.	1909-10. \$ cts.
Direct wages were.....	6,123 10	7,299 21	6,806 67
Indirect cost to be added to above.....	12,748 22	10,783 77	10,172 93
Percentage of indirect to direct.....	208 p.c.	148½ p.c.	35 34 p.c.

N. B.—The decrease of percentage in 1909-10 is explained by the fact that the woodworking departments, i. e. cabinet shop, carpenter shop, caulkers and saw mill, being under the charge of the same foreman, and closely related to each other; a uniform percentage was calculated for the above mentioned departments.

GENERAL EXPENSE		\$ cts.
Staff salaries.....		4,199 88
Rent.....		1,200 00
Power, heat and light, including deficit of \$127.23 in P. H. & L. account.....		4,435 23
Officers salaries, superintendent and time keeper.....		2,640 00
Building repairs.....		894 83
Yard.....		2,648 36
Teamsters and h. rses.....		686 74
Stores.....		1,428 82
Travelling expenses: Messrs. Papineau, Baril, &c.....		125 00
Gasoline launches { 'Bronx'.....	\$ 306 64	
{ 'Buffalo'.....	444 78	
{ 'Viator'.....	2 42	
		752 84
Water works.....		392 90
Wharves.....		249 31

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STATEMENT OF SHOP EXPENSE FOR FISCAL YEAR 1909-10, &c.—*Con.*

GENERAL EXPENSE—*Continued.*

	\$	cts
Repair and maintenance of shipyard railway	456	93
Difference with pay rolls	178	10
Fences	171	38
Telephones—Shipyard	213	28
Bell Telephone Co.	102	27
	315	55
Stationery	226	15
Postage stamps	100	00
Telegrams	24	69
Saw mill	103	92
Oars for shipyard workmen	144	97
Sundries	265	83
Deficit in stable account	1,299	24
	\$ 22,940	67
Less—Surplus of ways account	1,294	06
	\$ 21,646	61

	1907-08.	1908-09.	1909-10.
	\$ cts.	\$ cts.	\$ cts.
General expense account	24,996 44	27,834 84	21,646 61

OFFICE EXPENSE.

	\$	cts.
Salaries of clerks	2,137	46
Cleaning	159	00
Stores	122	84
	2,459	30

	1907-08.	1908-09.	1909-10.
	\$ cts.	\$ cts.	\$ cts.
Office expense	1,944 04	1,986 14	2,459 30

COST DEPARTMENT.

	\$	cts.
Salaries of Cost Clerk and assistants	2,942	64
	1,876	24
Cost Department account	2,452	11
	2,942	64

PROTECTION.

	\$	cts.
Wages of watchman	3,809	09
Less \$ charged to Fleet General Expense	2,856	77
	\$ 952	32

	1907-08.	1908-09.	1909-10.
	\$ cts.	\$ cts.	\$ cts.
Protection account	782 40	803 35	952 32

STABLES.

	\$	cts.
Wages of stablemen	1,233	83
Stores	2,325	51
Wagon repairs	1,229	15
Building repairs	278	13
Blacksmith shop	116	61
Power, heat and light	27	00
	\$ 5,112	23

	1907-08.	1908-09.	1909-10.
	\$ cts.	\$ cts.	\$ cts.
Stables account	4,474 98	4,327 55	5,112 23

3 GEORGE V., A. 1913

STATEMENT OF SHOP EXPENSE FOR FISCAL YEAR 1909-10—Con.

STORE EXPENSE.		\$	cts.
Salaries of store keeper and assistants.....		7,401	21
Yard.....		6,163	61
Teamsters and horses.....		1,989	96
Power, heat and light.....		1,098	00
Building repairs.....		906	32
Stores.....		80	81
Machine shop.....		108	22
Drafting.....		26	46
Saw mill.....		41	62
Inventory of structural steel.....		92	45
Sundries.....		175	32
		<u>\$</u>	<u>18,033</u>
			<u>98</u>

	1907-08.	1908-09.	1909-10.
	\$	\$	\$
	cts.	cts.	cts.
Store expense account.....	15,699	18,892	18,033
	51	96	98

POWER, HEAT AND LIGHT.

	Fire Hold No. 1.	Fire Hold No. 2.	Total.
	\$	\$	\$
	cts.	cts.	cts.
Boiler rooms—			
Firemen.....	1,717	755	2,473
Teamsters.....	922	108	1,031
Yard.....	110	219	330
Stores.....	191	124	316
Boiler repairs and sundries.....	506	321	831
Fuel—			
Coal.....	6,246	760	7,006
Coke.....		1,820	1,820
	<u>9,695</u>	<u>4,114</u>	<u>13,809</u>
Building repairs.....			55
Steam pipes repairs.....			268
Draughting.....			8
			<u>\$</u>
			<u>14,132</u>
			<u>45</u>
Power house—			
Sorel Electric Co.....		17,464	63
F. A. Cote, salary.....		1,699	92
Electricians.....		2,697	92
Stores—			
Power house.....	202		262
Electric light.....	59		88
Building repairs.....		367	60
Maintenance.....		247	08
Change of voltage.....		1,125	49
Maintenance of air pipes and compression.....		91	67
Sundries.....			<u>23,994</u>
			<u>28</u>
			<u>\$</u>
			<u>38,126</u>
			<u>73</u>
	1907-8.	1908-9.	1909-10.
	\$	\$	\$
	cts.	cts.	cts.
Power, heat and light account—			
Boiler rooms.....	11,604	14,141	14,132
Power house.....	23,905	23,106	23,994
	<u>34,509</u>	<u>37,247</u>	<u>38,126</u>
	96	13	73

SESSIONAL PAPER No. 57.

STATEMENT OF SHOP EXPENSE FOR FISCAL YEAR 1908-10—*Con.*
SAWING.

DR.

CR.

	Raw Material.		Product.	
	\$ cts.	\$ cts.	Ft. B.M.	\$ cts.
White pine—				
58,812 c. ft.	14,907 65			
56,864 ft. b.m.	2,618 66			
18,011 lin. ft.	2,331 45			
		19,757 76	556,682	28,116 11
B.C. fir—				
1,080 ft. b.m.		47 97	1,150	64 05
Elm—				
220,207 ft. b.m.		9,501 70	129,963	8,432 97
Red pine—				
106,083 ft. b.m.		4,233 34	98,327	5,900 21
Oak—				
2,269½ c. ft.	1,579 80			
804 ft. b.m.	44 22			
152 lin. ft.	45 60			
		1,669 62	23,458	1,638 76
Cypress—				
1,880 ft. b.m.		84 60	14,635	898 29
Spruce—				
91 lin. ft.		15 47	836	25 08
Maple—				
144 lin. ft.		36 00	1,320	66 00
Hemlock—				
31 lin. ft.		5 58	194	5 82
White ash—				
75 ft. b.m.		2 48	64	3 20
Slabs.....			(Cords) 693	2,079 00
		35,404 52		
Labour—				
Direct.....	2,939 84			
Indirect.....	927 25			
		3,917 09		
Surplus.....		5,907 88		
		45,229 49		45,229 49

RECAPITULATION.

	1907-08.			1908-09.			1909-10.		
	Direct.	Indirect.	p.c.	Direct.	Indirect.	p.c.	Direct.	Indirect.	p.c.
	\$ cts.	\$ cts.		\$ cts.	\$ cts.		\$ cts.	\$ cts.	
Asbestos department	1,296 57	406 29	33A	3,289 31	1,472 34	44½	5,791 06	1,527 18	26 85
Blacksmith shop	10,762 45	7,993 10	74½	10,345 55	7,608 15	73½	13,521 44	9,375 61	69 34
Boiler shop	64,311 05	43,036 86	67	74,721 44	43,305 12	58	83,264 27	40,340 81	48 50
Cabinet shop	3,026 98	3,976 98	131A	3,742 56	3,438 19	92	3,451 47	3,581 07	103 34
Carpenter shop	28,995 62	7,199 00	25	34,431 33	6,364 43	18½	37,712 67	6,707 45	18 34
Caulkers	7,721 84	1,658 44	22	9,013 90	1,331 39	14½	9,772 29	943 11	10 34
Draughting	6,934 76	4,267 78	61½	7,836 36	3,313 80	42½	8,074 92	2,140 81	24 60½
Electrical shop	3,609 39	2,150 45	60	2,715 70	1,882 16	69	3,497 97	1,518 48	43 4
Mould loft	7,307 80	3,702 48	50½	7,506 19	4,919 22	65½	7,179 92	4,670 41	65 05
Machine shop	23,357 67	14,007 24	60	29,806 04	13,751 80	46	40,517 76	13,867 10	34 22
Paint shop	16,790 01	4,683 13	28	19,449 60	5,122 26	26½	22,683 79	4,871 09	21 68
Pattern shop	5,512 29	5,547 60	99	5,726 51	5,432 85	95	6,026 85	5,014 73	83 22
Pipe shop	10,787 43	5,041 78	47	9,712 76	3,952 21	40½	11,631 65	4,563 45	39 71
Yard	24,745 15	4,900 73	20	27,394 13	5,582 47	20	31,445 43	5,141 18	16 35
Saw mill	6,123 10	12,748 22	208	7,200 21	10,783 77	147½	6,806 67	10,172 03	150 34
	221,672 11	121,320 21		253,345 00	118,260 13		291,887 47	113,387 41	

Average Percentages of all shops together: -1907-08, 54½ p.c.; 1908-09, 46½ p.c.; 1909-10, 38 85 p.c.

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The difference in the percentages of the following during the fiscal year 1909-10, is explained by the fact that cabinet shop, carpenter shop, caulkers and sawmill being under the same foreman and closely related to each other, a uniform percentage was calculated for these wood-working departments. The same arrangement for previous years would have given the following:—

1907-08..	55 ⁷ / ₁₀₀ per cent.
1908-09..	40 ² / ₁₀₀ "
1909-10..	35 ³ / ₁₀₀ "

RECAPITULATION OF STATEMENT OF SHOP EXPENSE FOR FISCAL YEAR, 1910-1911.

Producing Departments.	Direct.		Indirect.		Percentage of Indirect to Direct.
	\$	cts.	\$	cts.	
Asbestos department.....	5,240	83	1,560	20	29.77
Blacksmith shop.....	15,095	50	10,192	93	67.52
Boiler shop.....	95,866	11	40,309	40	42.04
Draughting.....	9,098	13	3,656	80	40.19
Electrical shop.....	3,931	83	1,219	53	31.02
Machine shop.....	44,214	46	17,416	26	39.39
Mould loft.....	7,675	57	4,811	39	62.68
Paint shop.....	22,414	16	4,099	97	18.29
Pattern shop.....	5,303	15	5,432	47	102.81
Pipe shop.....	13,469	24	4,617	91	34.28
Yard.....	36,665	38	7,766	28	21.15
Cabinet shop.....	3,879	22	4,987	32	
Carpenter shop.....	41,733	38	5,453	66	33.82
Caulkers.....	10,576	18	915	12	
Saw mill.....	5,638	42	9,556	02	
	320,821	55	122,005	26	38.03

EXPENSE OF NON-PRODUCING DEPARTMENTS.

	\$	cts.
General expense.....	21,579	93
Office expense.....	3,182	49
Cost department.....	2,815	96
Protection.....	\$ 3,817	92
Less $\frac{2}{3}$ charged to fleet.....	2,863	44
	\$ 28,532	86

SUNDRIES.

Stables.....	5,538	22
Store expense.....	27,048	74
Power, heat and light.....	42,403	46
Sawing.....	54,551	02
	\$ 129,541	44

Respectfully submitted,
 W. S. JACKSON,
 T. H. SCHWITZER.

OTTAWA, 12th May, 1912.

APPENDIX "A"

PARTICULARS OF BUILDINGS IN SOREL SHIP YARD.

No. of Building.	Description.	Size.	Used For.	Remarks.
NEW BOILER SHOP.				
2	Made in three parts: boiler shop on piles, steel structure, double boarded, sheet iron roofing on boards, large windows; rollers shop, concrete foundations, steel structure, board and sheet iron roofing, double boarded, large windows; janitor's office on piles, triple boarded floor and ceiling, board and sheet iron roofing.	Boiler shop 200 ft. long and 60 ft. wide, 20 ft. columns; Rollers shop 62 ft. long x 36 ft. wide, 20 ft. columns; Janitor's office 23 ft. long x 12 ft. wide, 12 ft. studs.	Boiler shop, Roller's shop and Janitor's office.	Good condition.
OLD BOILER SHOP.				
3	Old building on piles, wooden framed, half single boarded and half double boarded, board and shingle roofing; first story on ground, second story with a good floor and ceiling, good windows; one part is sheet iron roofed, about 40 ft. x 30 ft.	233 ft. long, 31 ft. 6 in. wide; 15 ft. studs.	1st story as shaping shop, boiler shop and steamfitter shop—also an office for yard. Second story used as a mould loft.	Fair condition.
OFFICES AND STORES.				
4	Old building, on piles, wooden, framed; one part triple boarded, one part double boarded, good floors and ceiling, small windows, board and shingle roofed.	267 ft. x 31 ft., 16 ft. studs.	Offices and stores; also serving department	
MACHINE SHOP.				
5	Main body: stone foundation, solid brick built three story high with iron doors, wooden framed, board and sheet iron roofed; the two aisles on piles, wooden framed, large windows and skylights, double boarded, board and sheet iron roofed, good floors, strong timber.	Main body: 60 ft. x 30 ft., 35 ft. walls; one aisle 120 ft. x 50 ft., 21 ft. studs; other aisle 99 ft. x 50 ft., 21 ft. studs.	Main body is fire hold No. 1; one aisle is machine shop, the other is machine shop at first story and pattern shop at 2nd; 2nd and 3rd stories of main body are used to keep patterns.	Good condition.
BLACKSMITH SHOP.				
6	On piles, wooden framed, double boarded, large windows, board and sheet iron roofed.	85 ft. x 60 ft., 18 ft. studs.	Smithshop with an annex for the horse shoer.	Poor condition.
WIRE ROPES, IRON AND WOOD STORE.				
7	On piles, wooden framed, shingle boarded, sheet iron and board roofed, front side with rolling doors.	196 ft. x 18 ft. 6 in., 13 ft. studs.	Waste shed contains wood, iron, life boats, &c.	Good condition.
STABLES AND STORE.				
8	On piles, wooden framed, half double boarded, half single boarded, good floors, small windows, board and shingle roofed; good divisions in stable.	100 ft. x 26 ft., 12 ft. studs.	Half used as stables and half as store and carriage room; second story for hay and grain.	Fair condition.

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PARTICULARS OF BUILDINGS—Continued.

No. of Building.	Description.	Size.	Used for.	Remarks.
	SPAR SHED.			
9	On piles, wooden framed, single boarded, sides movable, no floor, no windows, board and sheet iron roofed.	100 ft. x 30 ft. 6 in., 12 ft. studs.	Carpenter shop opened all around when wanted.	Fair condition.
	ICE HOUSE.			
10	On piles, wooden framed, quadruple boarded, double ceiling, board filled with sawdust, board and shingle roofing.	50 ft. x 24 ft., 12 ft studs.	Ice house.	Good.
	RIVET SHED.			
11	On piles, double boarded, floors, small windows, board and shingle roofing.	50 ft. x 26 ft., 12 ft. studs.	Shed for rivets and nails.	Good.
	RIVET SHED.			
12	On piles, double boarded, floors, small windows, board and shingle roofed.	61 ft. x 26 ft., 13 ft. studs.	Shed for rivets and nuts.	Good.
	MANILLA SHED.			
13	On piles, double boarded, floors, double windows, board and shingle roofed.	33 ft. x 26 ft., 14 ft. 6 in. studs.	Shed for manilla ropes.	Good.
	OIL SHED.			
14	On piles, double boarded, floors, double windows, board and shingle roofed.	24 ft. x 21 ft., 14 ft. 6 in. studs.	Shed for oils.	Fair.
	FLEET STORE.			
15	On piles, three story building, wooden framed, double boarded, board and sheet iron roofed, good windows and locked rooms, stairs and elevator.	100 ft. x 30 ft. 6-in., 28 ft. studs.	Fleet furniture winter quarters.	Good new building.
	POWER HOUSE.			
16	Solid brick building with outside in Laprairie pressed brick, limestone trimmings, stone foundations, concrete floor, steel structure, fire proof building, appendix containing waterworks in sub-soil concrete, piles under concrete foundations.	53 ft. x 33 ft.; 20 ft. columns.	Power house.....	Good new building.
	SAWMILL.			
17	Main body : concrete foundation resting on piles to strengthen the soil, steel structure, double boarded, spacious basement, sheet iron and board roofed, good windows and doors, two similar aisles on piles, wooden framed, single boarded, board and sheet iron roofed, good windows, an annex for w.c. on piles.	Main body 70 ft. x 60 ft.; 28 ft. columns; aisles 55 ft. x 28 ft., 13 ft. studs; w. c. 10 ft. x 8 ft., 8 ft. studa.	Basement contains motors and shaftings; 1st story, sawmills and offices; 2nd story, cabinet shop and the saw filing installation.	Good new building.
	PAINT SHOP.			
18	On piles, wooden frame; new building, good windows and doors, triple boarded, board and sheet iron roofed, particularly good floors, ceilings, stairs inside and outside.	170 ft. x 35 ft., 19 ft. studs.	1st story as paint-shop decoration room and asbestos department; 2nd story all along for a mould loft.	Good new building. Good.

PARTICULARS OF BUILDINGS—Continued.

No of Building.	Description.	Size.	Used for.	Remarks.
	PATTERN SHOP.			
19	On piles, double boarded, wooden framed, three floors, good windows and doors, board and sheet iron roofed.	100 ft. x 30 ft., 28 ft. studs.	Shed for patterns...	Good new building.
	DRY WOOD STORE.			
20	On piles, wooden framed, single boarded, rolling doors, board and sheet iron roofed, interior divided into racks.	51 ft. x 26 ft., 16 ft. studs.	To keep dry wood coming from dry kiln.	Good.
	NO. 2 FIRE HOLD.			
21	Concrete foundation, wooden framed, but space is allowed to put a 12-in. solid brick wall; double boarded, concrete floor and concrete base to boilers, board and sheet iron roofed.	53 ft. x 28 ft.	Fire hold No. 2 receiving fuel from sawmill by a fan-ner.	Good new building.
	CASTING SHED.			
22	On piles, wooden framed, single boarded, rolling doors, good windows, floors, board and sheet iron roofed; the annex is a platform to put castings outside, and around all is a fence forming a square with doors locked.	51 ft. x 32 ft., 18 ft. studs; platform 100 ft. x 35 ft.; square space locked, 130 ft. x 80 ft.	Shed for castings. 1st story for middle weight castings; 2nd story for brass and finished pieces; heavy castings on platform.	Good.
	DRY KILN.			
23	On piles, quadruple boarded, wooden framed, double ceiling, hoisting doors, ventilators, board and sheet iron roofed.	51 ft. x 26 ft., 11 ft. studs.	Dry kiln	Good.
	MACHINERY SHED.			
24	On piles, wooden framed, double boarded, good floors, board and sheet iron roofed.	56 ft. x 36 ft., 17 ft. studs.	Shed for machinery..	Good.
	ANGLE BENDING SHED.			
25	Concrete pillars, wooden framed, single boarded, opened arched front, board and sheet iron roofed with portable panels.	50 ft. x 25 ft., 10 ft. studs.	Shape bending forge.	Poor.
	NEW WAYS WINCH BUILDING.			
26	Pile foundations, wooden framed, single boarded; one side opened, board and sheet iron roofed.	24 ft. x 19 ft., 11 ft. studs.	New ways hoisting winch building.	Good.
	SCALE HOUSE.			
27	On piles, wooden framed, single boarded, board and shingle roofed.	27 ft. x 16 ft., 10 ft. studs.	Platform scale house.	Good.
	REELS BUILDING.			
28	On piles, wooden framed, single boarded, board and shingle roofed.	27 ft. x 16 ft., 10 ft. 6 in. studs.	Reels for fire apparatus building.	Good.
	OLD WINCH HOUSE.			
29	On piles, wooden framed, single boarded, board and shingle roof.	16 ft. x 15 ft., 9 ft. studs.	No use.. ..	No good

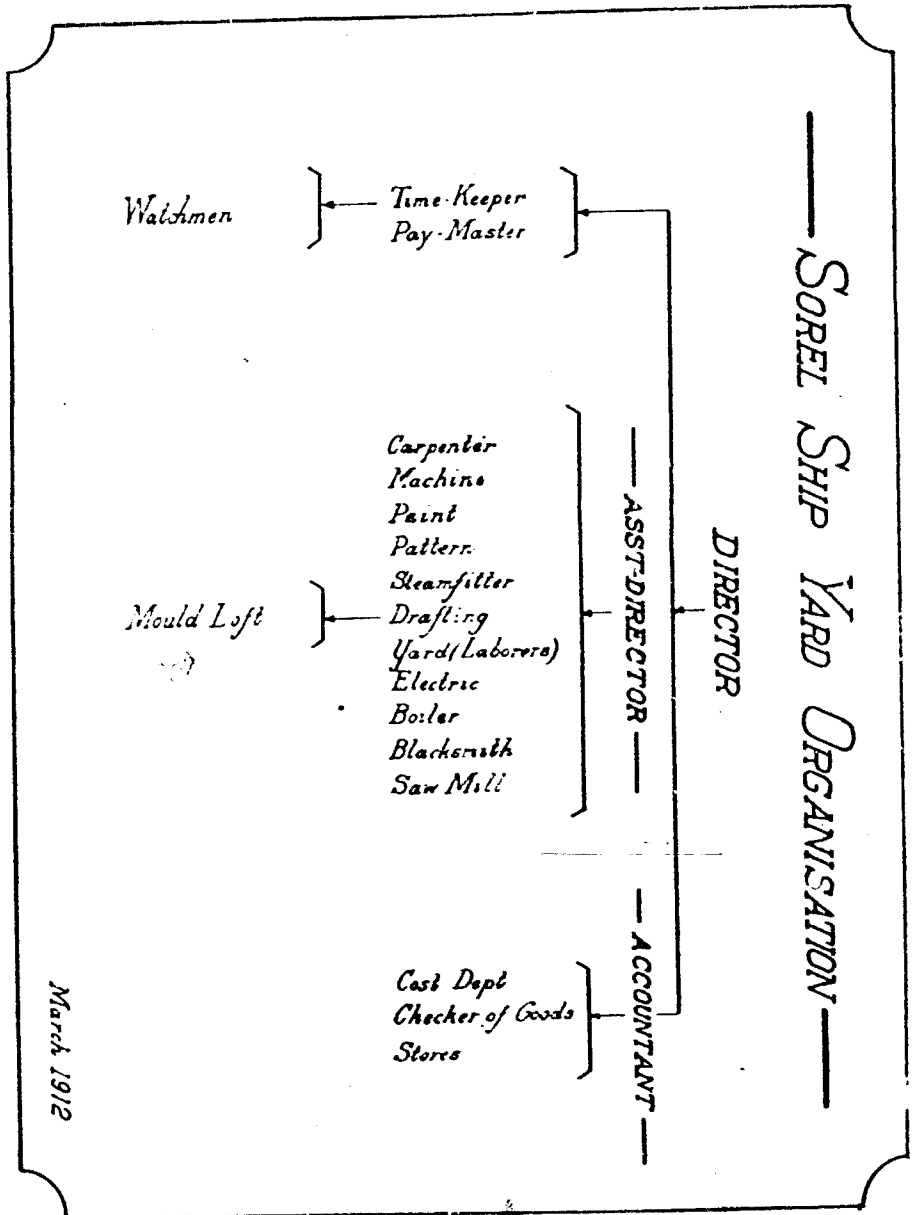
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PARTICULARS OF BUILDINGS—(Continued).

No. of Building.	Description	Size.	Used for	Remarks.
	OAKUM HOUSE.			
30	Old wood super-structure of boat placed on pieces of wood, linen roofed.	35 ft. x 12 ft.; 8 ft. high.	Oakum shop.	No good
	SHEAR LEGS HOISTING WINCH.			
31	Concrete and stone foundation, wooden framed single board, board and sheet iron roofed.	22 ft. x 16 ft., 9 ft. studs.	40 ton shear legs hoisting winch covering	Good
	LAUNCHES—REPAIRING SHOP.			
32	On piles, wooden framed, double boarded, good floor, board and shingle roofing.	15 ft. x 12 ft., 7 ft. studs.	Repairing shop for launches	Good
	SHED FOR LAUNCHES.			
33	Piles on ground, single boarded, wood framing, board covering.	61 ft. x 30 ft., 10 ft. studs.	Shed for launches and life boats	Good
	IRON KEEPER'S HOUSE.			
34	On piles, wooden framing, double boarded, shingle roofing.	13 ft. x 8 ft., 7 ft. studs.	House for the iron stock keeper	Fair
	W. C. DOUBLE.			
35	Concrete foundation, wood framing, double boarded, sheet iron roof.	14 ft. x 11 ft., 7 ft. studs.	Water closet	Good
	W. C. SINGLE.			
36	Concrete foundation, wood framing, double boarded, paper roofing.	18 ft. 6 in. x 5 ft. 6 in.; 7 ft. studs.	Water closet	Good

APPENDIX B.—Yard Plan (Not printed.)

APPENDIX C.



APPENDIX D.

CROSS EXAMINATION held in Sorel Government Shipyard on the 24th March 1912, by Messrs W. S. Jackson and T. H. Schwitzer.

Mr. JEAN BILODEAU. (MACHINE SHOP FOREMAN.)

Q. What is your name? A. Jean Bilodeau. Q. Since how long do you work in the yard? A. I am in the yards since 18 years. Q. Since how long are you foreman? A. Three years as foreman. Q. Where were you employed before coming into the yard? A. In the harbour of Montreal. Q. What sort of work did you do there? A. Machine work of all sorts, repairs, etc. Q. How old are you? A. 49 years. Q. What is your authority concerning the employment and discharging of men? A. I do not discharge any men. I make reports to Mr. Papineau. I have no authority. Q. Do you consider all the men employed in your department as permanent employees? A. Yes. Q. What do you do when a man comes late to work, two or three times a week. Do you report him accordingly? A. I make no report. When this happens too often, the man is suspended. Q. How many men are absent every day from your department, on an average? A. Five or six every day, on an average. Q. Do you consider that you have enough men in your department for the work you have to do? A. Yes. Q. Do you consider that you have more men in your department than you need? A. Not for the present, I have none too many. I have just the number I want. Q. How many men have you employed in your department during summer? A. From 92 to 95. Last summer I had 96. Q. On what work are those men employed during the summer? A. They are employed on repairs and on new construction. Q. How do you get a new employee when you need one? A. I ask Mr. Papineau for one. Q. Are you ever sent a new man when you have not asked for one? A. Yes, sometimes. Q. In that case, what do you do with that man? A. I give him work. Q. Do they ever send you a new man when you have no work for him? A. No. Q. Are you ever allowed to choose your own men? A. No, not all of them. Q. Do you consider all the men who are sent to you as being competent for the work of your department? A. I always choose work for them which they are able to do. Q. If they are not competent what do you do with them. A. I always give them work for which they are competent. Q. Do you fix the men's salaries yourself? A. No. Some times, because Mr. Papineau asks how much they are worth. Q. Do you report to the Director concerning the ability of a new employee before his salary is fixed? A. Yes, when Mr. Papineau sends for me and asks me what salary the man should be paid. Q. When a man comes late to work, does he report to you? A. No he does not make any report to me. If he comes at 9.30 he comes and reports to me. Q. What do you do when a man is disobedient or misbehaves? A. I make an immediate report to Mr. Papineau. Q. How can you check the time a man spends on a job? A. The time is marked on sheets. All the men's time is marked on sheets. Q. Do you place the men of your department yourself on the different kinds of work? A. Yes. Q. To whom do you report? A. Generally to Mr. Papineau, sometimes to Mr. Terreault. Q. Whom do you get your instructions from? A. Mr. Papineau and Mr. Terreault. Mr. Terreault sends us orders, but very often these come from Mr. Papineau. Q. What work have you on hand at the present time? A. We are finishing repairs to the fleet and especially repairs to the machinery on board Nos. 26 and 38. We also have machinery to make for No. 37. We have two scows to make. In fact we have lots of work. Q. How many men have you employed in your department who are not on construction work? A. I have an assistant, a man to sweep the shop, and a man to take care of the tools; in all three men.

Q. Who are these men? A. Casabon, Duplessis and Goulet. Q. Have you a clerk in your department and what is his work? A. No. I have no clerk. My assistant does all that work. Q. Who takes your place during your absence? A. My assistant, Casabon. Q. Do you punch the time-clock? A. No. Q. Do you report to the time-keeper every day, and if so how? A. Yes, I report three times a day. I have no order but I do it all the same. Q. Have you any other men in your department who do not punch the time-clock? A. No, I am the only one. Q. Do other departments or other officers interfere in what you consider the right way of managing your department? A. No, never. Q. Have you more men in your department now than you had last year at the same period? A. No, we have about the same number. Q. Have you more work ahead of you this year than last year? A. No, it is about the same thing. Q. Have you any changes to suggest in the way of managing your department through which you might obtain better work from your men without more expense to the Government? A. Yes, there should be more authority given to the foremen. A foreman should be able to discharge a man himself. He should be able to give good wages to those who deserve them and discharge the others. That is the only way to succeed. As it is now, when a man is discharged he procures outside influence. The Director is influenced by the Members of Parliament and that influence affects the foremen also. We often hear men who are discharged say: 'Never mind, I am going to see my Deputy'. There should be no political pressure on the management of the yard. A change in this would produce economy. Q. Have you any complaints to make? A. I have no complaints to make personally. I have never bothered myself about other departments and apart from what I say above, everything is all right. It is my department which has always given better satisfaction. Q. Can you read and write? A. Yes. Q. Are you paid for extra work? A. No. My men are paid for working after hours. They are paid time and a half. Q. How many men have you under your control? A. Twenty-six. I have two mechanics and the rest are helpers. Q. Are the helpers paid the same wages as the mechanics? A. No. They only get full pay as helpers. Q. Are any of your men on this list considered no good? A. No, they are good according to the wages they get. Q. Is there any one that you could do without and the work go on the same? A. No, I have work for all I have. Q. What do the helpers do? A. I have a gang of them in the shop who put down the big pieces of machinery and do all the heavy work in the machine shop. I have to keep a gang there all the time. They are kept busy all the time. They put the work together and they are busy. I have nine men there. Q. Do you need them all? A. Yes, every winter the buckets are put inside the shop. My men work harder than any one else in the yard. My men are not all mechanics. They are helpers and if I were to employ all machinists this would prove more expensive. As a man gets more valuable he is given a raise of wages.

Mr. BRACONNIER (BOILER SHOP FOREMAN).

Q. What is your name? A. M. Braconnier. Q. How long have you worked in the yard? A. 15 years. Q. Since how long are you a foreman. A. 15 years. Q. Where were you employed before coming into the yard? A. I worked for the Richelieu Company for one year. Then I worked four years on the elevators in Montreal. Q. What sort of work did you do there? A. I was second engineer on board the Richelieu boats and did repair work. Q. How old are you? A. 56 years old. Q. What is your authority concerning the employment and discharging of men? A. I have no authority at all. I can discharge men but they always come back with a letter or order from the Member of Parliament about two or three days after and I am obliged to take them back. Q. Do you consider all the men employed in your department as permanent employees? A. The good men, of old standing, are considered as permanent. The new ones are not permanent and can be discharged at any time. Q. What do you do when a man comes late to work, two

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or three times a week. Do you report him accordingly? A. No, I don't report him. When it happens too often I reproach him with it, but for late coming two or three times I do not report him as long as the work does not suffer. Q. How many men are absent every day from your department on an average? A. From 20 to 25. Some times 30, but on an average between 20 and 25. Q. Do you consider that you have enough men in your department for the work you have to do? A. I have too many. I have made a report to the effect of discharging from 20 to 25. Q. How many men have you employed in your department during summer? A. On an average I have from 190 to 195. Q. On what work are those men employed during the summer? A. They work at the flanges and others putting work together and repairs. Q. How do you get a new employee when you need one? A. I have never had occasion to ask for one. My men are always sent to me before I ask for them. Q. Is a new man ever sent to you when you have not asked for one? A. Yes. Q. In that case what do you do with that man? A. I put him with the gang, and I give him work. Q. Do they ever send you a new man when you have no work for him? A. Yes. Q. Are you ever allowed to choose your own men? A. No. I do not make the choice. Q. Do you consider all the men sent to you as competent for the work of your department? A. No, they are not always competent. Q. If they are not competent, what do you do with them? A. I do the best I can with them. I consider these worth something and I make a recommendation accordingly. Complaints are made to me sometimes about the wages being too low. Q. When a man is sent to you, do you allot him to the work you think him fit for? A. Yes. Q. Do you fix the men's salary yourself? A. Sometimes. At other times, I have no knowledge of the question. Q. Do you report to the Director concerning the ability of a new employee before his salary is fixed? A. Yes, sometimes when the occasion presents itself. Q. When a man comes late to work, does he report to you? A. No. He cannot punch the clock and that is a check on him as he loses a quarter day. When he comes at 9.30, he is forced to report to me. Q. What do you do when a man disobeys or misbehaves? A. I make a report to Mr. Papineau. That man is suspended for one or two days. He returns to me and things are sometimes no better. If he continues to come late I report him again; he is suspended again and his time is lost. Q. How can you check the time he spends on a job? A. I keep no record of that. Q. Do you place the men of your department on the different kinds of work yourself? A. Yes. Q. To whom do you report? A. To Mr. Papineau. Sometimes to Mr. Terreault, when Mr. Papineau is absent. Q. Whom do you get your instructions from? A. From Mr. Papineau. Q. What work have you on hand at the present time? A. We have scows to repair, some boilers, etc. The new construction of dredges 26 and 27. Two boilers is new work. Q. How many men have you employed in your department who are not on construction work? A. I have a clerk, nine foreman. Q. Who are these men? A. Their names are on the list. Q. What are they employed at? A. The clerk checks the men's time, but he also works. The foremen see that the men are at work on jobs which I cannot see to myself. Q. Who takes your place during your absence? A. I have never been absent one hour. Q. Do you punch the time-clock? A. No. I work enough, night and day, and I don't need to punch the clock. Q. Do you report to the time-keeper every day, and if so, how? A. I report every day, as to the men and the work going well. Q. How often do you report to the time-keeper? A. Twice a day. Q. Have you any other men in your department who do not punch the time-clock? A. No. They all punch. Q. Do other departments, or other offices, interfere in what you consider the right way of managing your department? A. No, not that I know of. Nobody interferes. Q. Have you more men in your department now than you had last year at the same period? A. Yes. Q. Have you more work ahead of you this year than

last year? A. No. We have only a dredge to finish. We are to discharge 120 men at the end of the month. At the other pay-day, we are to discharge 40 more because the work on the fleet will be finished and I shall have too many men. Q. Have you any changes to suggest in the way of managing your department, through which you might obtain better work from your men without more expense to the Government? A. Yes. The great objection is that foremen have not enough authority over the men and cannot control them as they would like. I have knowledge of men and I can tell when their salary is not sufficient, and when they come to me, I should be able to settle the question myself and not send them to Mr. Papineau. Again, I would take men when I needed them and would discharge them when they would be required no longer. If the foremen had more authority they would be better. A foreman should have full control over his men, pay according to their work, take on and discharge them as he sees fit. Q. Have you any complaints to make? A. None, except what I have stated above. Q. Can you read and write? A. No. Q. Are you in charge of boiler makers, ship platers, riveters, caulkers, drillers? A. Yes. Q. Are you in charge of men working on board the ships? A. Yes, of all men except the carpenters, joiners, etc. Q. How many under-foremen have you? A. Sometimes 7, sometimes 10 and sometimes 12. Q. Are you paid extra for working overtime? A. No. Q. Are the men paid extra for working overtime? A. Yes, the men are paid extra for working overtime. The under-foremen are also paid extra. Men and under foremen are paid time and a half. Q. Do you mast and rig the vessels? A. Yes, we put in the masts, but the rigging is done by two special men under the head-carpenter. Q. Are you responsible for putting boilers on board? A. Yes. Q. Will you rig up the new shear legs and move all heavy wenghts about the yard? A. Yes.

Mr. ALEXIS GENDRON (YARD FOREMAN).

Q. What is your name? A. Alexis Gendron. Q. How long have you worked in the yards? A. Since 1896, 16 years. Q. Since how long are you foreman? A. Since 1897, 15 years. Q. Where were you employed before coming into the yard? A. The Richelieu Company. Q. What sort of work did you do there? A. Carpenter's work. Q. How old are you? A. 54 years old. Q. What is your authority concerning the employment and dismissal of men? A. I have no authority whatever. Q. Do you consider all the men in your department as permanent employees? A. No, they are not all permanent. Q. What do you do when a man comes late to work, two or three times a week. Do you report him accordingly? A. I do not report him, as the time-clock controls the men's time when they are late. Q. How many men are absent every day from your department on an average? A. 7 or 8 on an average. Q. Do you consider that you have enough men in your department for the work you have to do? A. At the present time, yes. Q. Do you consider that you have more men in your department than you need? A. No, I have none too many. Q. How many men have you employed in your department during the summer? A. From 125 to 130 on an average. Some summers we have more than that. Q. On what work are those men employed during summer? A. Unloading material, iron, wood coming on the cars, then construction, handling of heavy pieces, &c. Q. How do you get a new employee when you want one? A. I ask Mr. Papineau for one. Q. Is a new man ever sent to you when you have not asked for one? A. Yes. Q. In that case what do you do with the man? A. I put him at work on a job which I think he is fit for. Q. Do they ever send you a new man when you have no need for him? A. I always have work for those they send me. Q. Are you ever allowed to choose your own men? A. No, not all. Q. Do you consider all the men sent to you as being competent for your work? A. No, they are not all competent. Q. If they are not competent, what do you do with them? A. I make a report to the Director. Q. When a man is sent to you, do you allot him to the work you think him fit for? A. I give him a trial, then I put him

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at the work he can do. Q. Do you fix the man's salary yourself? A. No, I do not. Q. Do you report to the Director concerning the ability of a new employee before his salary is fixed? A. Not always. I make a report when I am asked to. When a salary is a little higher than others it is because I have recommended it. Q. When a man comes late to work, does he report to you? A. Sometimes they come and tell me it is too late for them to work. Q. What do you do when a man disobeys or misbehaves? A. I make a report to the Office. Q. How can you check the time a man takes to do a job? A. No record is kept of that; we use our own judgment to calculate the time taken. Q. Do you put the men of your department on the different kinds of work yourself? A. Yes, I do. Q. To whom do you report? A. To the Director or to the Assistant Director. Q. Whom do you get your instructions from? A. Generally from the Assistant Director. Q. What work have you on hand at the present time? A. We have the dredge No. 8, new piping for the pumps. Repairs to the *Terrebonne*; then the construction of No. 38; the putting in shape of things for the getting out of boats in the Spring. Q. How many men have you employed in your Department who are not on construction work? A. I have a clerk and 10 sub-foremen. Q. Who are these men—what are they employed at? A. The sub-foremen keep the men's time and the clerk transfers them to the office. They do other work besides, seeing that the men work. Q. Who takes your place during your absence? A. I have been replaced twice by my first sub-foreman, Mr. Cornoyer, eight days in all. Q. Do you punch the time-clock? A. No. Q. Do you report to the timekeeper every day, and if so, how? A. The clerk makes report to the timekeeper. The timekeeper sees me every day and I have no report to make to him personally. Q. How often do you report to the timekeeper. A. Report is made every day by the clerk and sub-foreman. Q. Have you any other men in your department who do not punch the time-clock. A. No, they all punch the clock. Q. Do other departments, or other officers interfere in what you consider the right way of managing your department? A. No, nobody interferes. Q. Have you more men in your department now than you had last year at the same period? A. I have about the same number. Q. Have you more work ahead of you this year than last year? A. No. Q. Have you any changes to suggest in the way of managing your department, through which you might obtain better work from your men, without more expense to the Government? A. If we had more authority over the men, things would be better. The men now are put in by the Members of the House, and this is unfortunate for the yard. The men are independent and we lack authority over them. Q. Have you any complaints to make? A. No, except what I have said just now. Q. Can you read and write? A. Yes. Q. Are you paid extra for additional time put in? A. No, I am not paid extra. The men and sub-foremen are paid extra but not me. Q. Can you discharge any men? A. No. Q. Have you any men whom you consider as of no use to you, whom you would like to see discharged? A. No, I need all the men I have.

MR. SIMEON CHATEAUVERT (BLACKSMITH SHOP FOREMAN).

Q. What is your name? A. Simeon Chateauvert. Q. How long have you worked in the Yard? A. Since 1875, but I was away five years. Q. Since when are you foreman. A. I am foreman since five years. Q. Where were you employed before coming into the Yard? A. I was employed with Messrs. Beauchemin at Sorel. Q. What sort of work did you do there? A. I worked on the boats, in the mills, blacksmith work, at work of my trade. Q. How old are you? A. 63 years old. Q. What is your authority concerning the employment or dismissal of men? A. I have not the authority I should have. Q. Do you consider all the men employed in your department as permanent employees? A. Yes, they may be considered permanently employed. Q. What do you do when a man comes late to work two or three times a week. Do you report him accordingly? A. I make no report. The

time clock is there for that purpose. Q. How many men are absent every day from your department on an average? A. Sometimes one or two, but as a rule everyone is there. Q. Do you consider that you have enough men in your Department for the work you have to do? A. I have enough now, but in a short time I shall have too many. Q. Do you consider that you have more men in your Department than you need? A. Not now. We might dismiss a few, but the rest of them would have to work harder and be paid higher wages, although they do good work now. Q. How many have you employed in your Department during summer? A. About the same number as now. Q. On what work are those men employed during summer? A. On ship repairs and on new construction work. Q. How do you get a new employee when you need one? A. I ask the Director for one. Q. Is a new man ever sent you when you have not asked for him? A. No. We get exactly the number we require. Q. Do they ever send you a new man when you have no work for him? A. No. Q. Are you ever allowed to choose your own men? A. I recommend my men and they are chosen. Q. Do you consider all the men sent to you as competent for the work of your department? A. Yes, I think they are all competent for their work. Q. When a man is sent to you, do you allot him to the work you think him fit for? A. Yes. When I recommend a man I know what work he can do, and I put him at it. Q. Do you fix the man's wages yourself? A. No. The salaries are fixed at the Office, but when an employee takes the place of another one he gets the same salary as that other one did. Q. Do you report to the Director concerning the ability of a new employee before his salary is fixed? A. Yes. Q. When a man comes late to work, does he report to you? A. No, because he cannot start to work, he cannot come in. Q. What do you do when a man disobeys you or misbehaves? A. I report and make a complaint, but this does not often happen. Q. How can you check the time a man spends on a job? A. We do not keep a record, but my experience teaches me whether the time spent on a job is reasonable or not. I always see that a job is finished within a reasonable time. Q. Do you put the men of your Department on the different kinds of work yourself? A. Yes. Q. To whom do you report? A. To the Director, Mr. Papineau. Q. Whom do you get your instructions from? A. From Mr. Papineau. Q. What work have you on hand at the present time? A. Repairs to ships, dredges, tugs. General repairs. Q. How many men have you employed in your Department who are not on construction work? A. I have a clerk. Q. Have you a clerk in your Department, and what is his work? A. Yes. He checks and keeps the men's time. He makes reports, receives orders and transmits them. He makes the requisitions for the stock wanted, and keeps the time in connection with the work. Q. Who takes your place during your absence? A. My first blacksmith. Q. Do you punch the time-clock? A. No. Q. Do you report to the timekeeper every day, and if so, how? A. I give my report to the timekeeper about the men's time on work. Every morning that time-sheet goes to the timekeeper. Q. How often do you report to the timekeeper? A. Once a day. Q. Have you any other men in your Department who do not punch the time-clock? A. No, they all punch. Q. Do other departments, or other officers, interfere with what you consider the right way of managing your Department? A. No. Nobody ever interferes with me. Q. Have you more men in your Department now than you had last year at the same period? A. Only two more, a blacksmith and a helper. Q. Have you more work ahead of you this year than last year? A. No, not as much. Q. Have you any changes to suggest by which you might obtain better work from your men, without more expense to the government? A. I do not see what could be changed. For the work we do there is not much to be changed. We should have the power though of giving the men the wages they are worth. Q. Have you any complaints to make? A. No, I have no complaint to make. Q. Can you read and write? A. Yes, a little. Q. Are you paid for extra work done by you? A. No, I am not paid extra. The men are paid for extra work. They are paid at the rate of time and a half. They very seldom do extra work. Q. What is the weight of your steam hammers? A. The big one strikes about 15 tons, the others

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about 6 tons. Q. Do you get any blacksmith work bought in? A. No, we buy no material for the blacksmith? Q. Do you do horse shoeing? A. We do all sorts of blacksmith work. Q. Do you make Engine forgings, connecting rods and small forgings, etc.? A. Yes, forgings for winches, engines, &c., anchor cranes, rail stations, boat davits, etc. Q. Does the Director ever ask you if you have room for more men? A. No. Q. Have you good control over your men? A. Yes, all the control I want. Q. Are all forgings made for new construction weighed by you and a record sent to the office of finished weights? A. Yes, as soon as a piece is finished, it is weighed, the weight entered on a sheet and the sheet forwarded to the Office. Q. Do you speak English? A. No.

Mr. N. BADEAU (FOREMAN OF CARPENTERS--MOULD LOFT No. 2.)

Q. What is your name? A. Napoleon Badeau. Q. How long have you worked in the Yard? A. I have worked for 45 years, but have been absent for two years. Q. How long have you been foreman? A. I was engaged as constructor in 1892. Before that I was sub-foreman. Q. Where were you employed before coming into the Yard? A. I have always been employed here. Q. How old are you? A. 61 years old. Q. What authority have you concerning the employment and dismissal of men? A. If a man does not suit me I report to Mr. Papineau. I have no direct authority. Q. Do you consider all the men employed in your Department as permanent employees? A. No. As soon as work gets scarce we discharge some. Q. What do you do when a man comes late to work two or three times a week. Do you report him accordingly? A. This is effected through the time-clock. We cannot see to that ourselves. If the men miss work they lose their time and pay. Q. How many men are absent every day from your Department on an average? A. Very few. On an average two or three a day out of 108 men we have. Q. Do you consider you have enough men in your department for the work you have to do? A. Yes. I have just the number I want now. Q. Do you consider that you have more men in your department than you need? A. No, I have exactly the number I require. Q. How many men have you employed in your department during summer? A. Sometimes we have as many as 250 during summer, but for some years back the work has been subdivided and now we have about the same number as in winter. Q. On what work are these men employed during summer? A. They work on repairs generally and new construction work. Q. How do you get a new employee when you need one? A. I refer to Mr. Papineau. Q. Is a new man ever sent to you when you have not asked for one? A. Yes. Q. In that case what do you do with that man? A. I put him at work with the others and get the best possible out of him. Q. Do they ever send you a new man when you have no work for him? A. There is always work to do and I never have any trouble on that score. Q. Are you ever allowed to choose your own men? A. Never, unfortunately. Sometimes I will say: 'there is a man who would suit me', and he is sent to me, but oftener men are sent to me without my recommending them. Q. Do you consider all the men sent to you as being competent for the work of your department? A. It often happens that the men sent to me are not competent. Q. If they are not competent what do you do with them? A. I have to put up with them. I sometimes have to neglect my own work to show them what to do, and this is a cause for trouble. Q. When a man is sent to you, do you allot him to the work you think him fit for? A. As a rule I place them where I judge best. Q. Do you fix the man's wages yourself? A. No, and that is very unfortunate. Q. Do you report to the Director concerning the ability of a new man before his salary is fixed? A. The wages are fixed without my being consulted. Sometimes I am asked if so and so is a good man. Q. When a man comes late to work, does he report to you? A. If a man comes late, he goes back. The time-clock is closed; he does not work and is not paid. If he arrives at 9.30 he goes and punches the

clock and then reports to me. Q. What do you do when a man disobeys you or misbehaves? A. It happens sometimes that a man does not obey orders. I then send him away telling him to come back when he is disposed to work. There is no direct disobeying, but rather misconduct. I then report to the Director who tells me to send the man away and take his time card from him. Q. How can you check and record the time a man spends on a job? A. I am supposed to watch the men two or three times a day and I make a guess at the time spent. The job-number is a guide, because we know that a job should cost so much and that it should take so much time to do it. We base the time needed on the job-numbers. I have sub-foremen all the time with the men and they keep an eye on their work. Do you place the men of your department on the different kinds of work yourself? A. Yes. Q. To whom do you report? A. To Mr. Papineau. Q. Whom do you get your instructions from? A. As a rule from Terrecault, the assistant director. Sometimes from Mr. Papineau. Q. What work have you on hand at the present time? A. The construction of four scows of 200 yards capacity; the joiner work for dredges No. 36 and No. 38; the construction of a rock-crusher and two tugs. Q. How many men have you employed in your department who are not on regular construction work? A. I have five sub-foremen. Q. Who are these men? A. N. Cornoyer, Pierre Peloquin, N. Thibault, N. Martineau and Narcisse Peloquin. Q. What are they employed at? A. They superintend the men's work and see that they perform their duties according to given orders. Q. Have you a clerk in your department, and what is his work? A. Of late I have a young clerk. He makes the requisitions for the wood required. He keeps the men's time and the place where they work. He does not make requisitions without my orders. I sign all the orders. Q. Who takes your place during your absence? A. I am never absent. My assistant could represent me. Q. Do you punch the time-clock? A. No, I never punch it. Q. Do you report to the timekeeper every day, and if so how? A. The timekeeper sees me every day and I do not have to report to him. He is one of my men and I see him three or four times every day. Q. Have you any other men in your department who do not punch the time-clock? A. No, I would not stand that. Q. Do other departments, or other officers interfere in what you consider the right way of managing your department? A. No, nobody interferes with me. Q. Have you more men in your department now than you had last year at the same period? A. I have about the same number. We have taken new men on but they were to replace others who had gone. Q. Have you more work ahead of you this year than last year? A. No. If nothing happens, we will soon have less work than last year. Q. Have you any changes to suggest in the way of managing your department through which you might get better work from your men without more expense to the Government? A. I wrote to the Minister in 1910 a letter giving him all the details needed on that subject. In my opinion the Director should put more confidence in his foremen. They have no authority and no control over the men. Q. Have you any complaints to make? A. Well, we have no control, with the result that the men are more or less nonchalant. The Director has no confidence in us. We have no control over the men and nobody is responsible in the yard. Q. Can you read and write? A. Yes. Q. Are you paid extra for additional work? A. No, I am not paid. The men who work overtime are paid about time and a quarter. Q. Are you responsible for laying the keel, making and preparing ribbing, shoring and keeping fair the vessels while building? A. Yes, I am responsible for all that. Q. Are you responsible for launching the boats and for placing the dredges? A. Yes. Q. Do you have any control over the buying of wood? A. No. Q. Are you responsible for moulding loft work? A. Yes. I have an assistant loft-man with me. One of the lofts is not necessary. There are two lofts, but one would be sufficient. Q. Do you build small boats? A. Yes. Q. What kind of wood do you use for templates? A. Common pine. Q. Where do you get it from? A. We get it from Montreal. Q. How many men do you control approximately? A. About 107. Q. Do you supervise all the new construction wood-work personally? A. Yes. I supervise the

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launching as well. Q. Have you any men whom you consider had better be discharged? A. Yes, two or three men could be well dismissed. There are some old employees, of 30 or 35 years service, who could be dismissed, but they are kept on through consideration of their long services. There are four of them.

Mr. E. F. LACHAPLLE (SAWMILL FOREMAN).

Q. What is your name? A. E. F. Lachapelle. Q. How long have you worked in the yard? A. Since August, 1906. Q. How long have you been foreman? A. Since July, 1911. Q. Where were you employed before coming into the yard? A. I was at St. Ours on sawmill construction. Q. What sort of work did you do there? A. I was proprietor of a sawmill. Q. How old are you? A. 37 years old. Q. What authority have you concerning the employment or dismissal of men? A. I have no authority whatever for employing or dismissing men. I have to refer to the Director for that. Q. Do you consider all the men employed in your department as permanent employees? A. No, not one is permanent. As long as there is work and they do well they are kept on. Q. What do you do when a man comes late to work two or three times a week? Do you report him accordingly? A. I give him notice once, and if it occurs again I report to the Director. Q. How many men are absent every day from your department on an average? A. Three or four on an average every day. Q. Do you consider that you have enough men in your department for the work you have to do? A. Yes. Q. Do you consider that you have more men than you need? A. Well, this varies. Sometimes we have more than we need. At the present time we have about just what we want. Q. How many men have you employed in your department during summer? A. About 20, that is since I am foreman. Q. On what work are these men employed during the summer? A. The same work as during the winter. The carting and preparing of the lumber. The piling of the lumber, the putting it in the dry kiln, and putting it safely in the sheds. Q. How do you get a new employee when you need one? A. I go and ask the Director. Q. Is a new man ever sent to you when you have not asked for one? A. No. This has never happened in my case. Q. Do they ever send you a new man when you have no work for him? A. No, never. Q. Are you ever allowed to choose your own men? A. Yes. I choose them myself. Sometimes a man is suggested by the Member for the House or by a person having influence, to the effect that that man is able to do the work, and if I consider that the said man is as able as stated I recommend him to the Director. Q. Do you consider all the men sent to you as being competent for the work of your department? A. Not always. Q. If they are not competent, what do you do with them? A. We are obliged to take them on and put them at work. Among the new ones there are willing men but they are not all capable. Q. Do you fix the men's wages yourself? A. I send them to Mr. Papineau with the recommendation that they be given a certain salary. Q. Do you report to the director concerning the ability of a new employee before his salary is fixed? A. Yes. Q. When a man comes late to work, does he report to you? A. No. He cannot come late without losing his pay. He loses a quarter of a day. I do not report to the Director except if the work is in a hurry and I make representations to the man himself. Q. What do you do when a man disobeys you or misbehaves? A. I report him to the Director at once. Q. How can you check and keep record of the time a man spends on a job? A. I have never had any complaint about the delay in my work. The preparation of the wood is always quickly done and I have no complaint to make on that subject. Since I am foreman I always give notice to the men that the work I put them at is pressing and that they must hurry up. Q. Do you place the men of your department on the different kinds of work yourself? A. Yes. Q. To whom do you report? A. To the Director. Sometimes the watchmen are given notice to have to look at this and that thing. Those

watchmen must report to the Director himself if they have trouble with the men. Q. Whom do you get your instructions from? A. From the Director and the assistant director. I receive orders for the preparation of my work from the construction foreman, Mr. Badeau. Q. What work have you on hand at present time? A. I have flooring to get kiln dried, also ship fenders to prepare for Nos. 36 and 37. Also for the construction of No. 42, that is to say two scows. Also ordinary repairs, etc., provision boxes, tool handles. I have also two men sharpening saws, band saws, etc., and other tools. Q. How many men have you in your department who are not employed on construction work? A. I have two clerks. One for the mill. The requisitions are made by myself, the clerk takes the quantity of wood which comes up to be sawn, measures it and figures the product when it comes out of the saw. The other clerk is in the office and checks the lumber which comes out. I countersign the requisitions and send them back to him. Q. Who takes your place during your absence? A. Mr. Ange s, my assistant, who has all the knowledge necessary to take my place. Q. Do you punch the time-clock? A. No. Q. Do you report to the timekeeper every day, and if so, how? A. No. I am not asked to make any report. Q. Have you any other men in your department who do not punch the time-clock? A. No, they all punch. Q. Do other departments, or other officers, interfere in what you consider the right way of managing your department? A. No. Nobody ever interferes. Q. Have you more men in your department now than you had last year at the same period? A. I was not foreman at the same period last year. I believe though that the number of men was about the same as now. Q. Have you more work ahead of you this year than last year? A. No, we have less work than last year. Q. Have you any changes to suggest in the way of managing your department through which you might get better work from your men without more expense to the government? A. When I was given absolute control I made quite a few improvements. Still, things might be better if the Director had more authority and freedom of action. I believe that the Members of the House and those who represent them bring pressure to bear upon the Director. For instance, a man is reported to Mr. Papineau, who discharges him, and that man is taken back again in a couple of days by the influence of the Member, and so on. Q. Have you any complaints to make? A. The only thing that could be improved would be that the yard be absolutely managed as if it was a private company and not under the control of a government or a political party. Q. Can you read and write? A. Yes. Q. Are you paid extra for additional hours of work? A. No, I am never paid for extra work. My men very seldom do any extra work; in fact I may say they hardly do any, although I believe that my department turns out more work than any other. A tally is kept of all the wood, square or round, which is cut up for dimension timber. All the other lumber, slabs, etc., is kept in stock and an account is kept in the office.

MR. J. A. PAYETTE. (PAINT SHOP FOREMAN).

Q. What is your name? A. J. A. Payette. Q. How long have you worked in the Yard? A. Three months, since January. Q. How long have you been foreman? A. Three months. Q. Where were you employed before coming into the yard? A. I was contractor in Sorel. I had a shop. Q. How old are you? A. 32 years old. Q. What authority have you concerning the employment and dismissal of men? A. I have no authority whatever. When a man does not suit I report him to Mr. Papineau. Q. Do you consider all the men in your department as permanent employees? A. Not all, but, of course, being here only for three months I could not tell for a certainty. Q. What do you do when a man comes late to work, two or three times a week. Do you report him accordingly? A. Yes, I report him to the Director. Q. How many men are absent every day from your department on an average? A. Three or four on an average. Q. Do you consider that you have enough men in your department for the work you have to do? A. Yes. Q. Do you consider that you have more men in your

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department than you need? A. No, I have just enough. Q. How many men have you employed in your department during summer? A. I cannot say. Q. How do you get a new employee when you need one? A. I have not had occasion to see that yet. The men come to me and I send them to the Director. Q. Is a new man ever sent to you when you have not asked for one? A. This has not happened yet. Q. Do they ever send you a new man when you have no work for him? A. This has not happened yet. Q. Are you ever allowed to choose your own men? A. I have not had occasion yet, but I think I would choose them myself. Q. Do you consider all the men sent to you as competent for the work of your department? A. Not all. Three fourths of them are good for rough work. Q. If they are not competent what do you do with them? A. I put them at work which they are able to do. We have all kinds of work. Q. When a man is sent to you, do you allot him to the work you think him fit for? A. It is myself personally who puts him to work according to his ability. Q. Do you fix the men's wages yourself? A. No. Q. Do you report to the Director concerning the ability of a new man before his salary is fixed? A. Yes, I report to the Director who fixes the salary. Q. When a man comes late to work, does he report to you? A. I cannot say. I have no report to make. The man loses his pay. Q. What do you do when a man disobeys you or misbehaves? A. I report him to the Director. Q. How can you check and keep record of the time a man spends on a job? A. I take note of his time according to my own judgment, I do not keep any record. Q. Do you place the men in your department in the different kinds of work yourself? A. Yes. Q. To whom do you report? A. To the Director. Q. Whom do you get your instructions from? A. The Director. Q. What work have you on hand at the present time? A. Painting of all the ships, dredges, etc., of the fleet. Q. How many men have you employed in your department who are not on construction work? A. I have none. Q. Have you a clerk in your department and what is his work? A. No, I have no clerk, I keep the men's time myself. Q. Who takes your place during your absence? A. I have never yet been absent. My assistant could replace me. Q. Do you punch the time-clock? A. No. Q. Do you report to the timekeeper every day, and if so, how? A. No, I am always here before seven o'clock to set the men at work and leave at 5.30. I do not need to make any report, at least I have no orders to that effect. Q. Have you any other men in your department who do not punch the time-clock? A. No, they all punch the clock. Q. Do other departments, or other officers, interfere in what you consider the right way of managing your department? A. No, I am never interfered with. Q. Have you more men in your department now than you had last year at the same period? A. No, last year they had 98, now we only have 57. Q. Have you any more work ahead of you this year than last? A. It is just about the same. Q. Have you any changes to suggest in the way of managing your department through which you might obtain better work from your men without more expense to the government? A. I would like to have full control of my men. As it is now if a man without any ability is sent to me, I am forced to give him a salary which he does not earn. Often an able man would like to be paid adequate wages and cannot succeed. So far, I see no way of improving this state of things. Q. Have you any complaints to make? A. The quality of paints is poor. I have made complaints to the Director, but without any results. I am forced to accept what is given me, in the line of white lead, ochre, etc. Q. Can you read and write? A. Yes. Are you paid extra for overtime work? A. No, I am not paid extra. The men are paid time and a half for extra work. Q. Have you any men whom you consider you would be better without? A. No. I have no men to discharge. There are men who are paid too dear. Some time ago some fifty painters were discharged and about half of them were taken back. The reason for this was that the winter work was all finished. Q. Do you mix all paints here? A. Yes. Q. Do you keep track of amount of paint used on each job? A. All the paint used on a job is weighed and charged to that job? A. Do you do all the glazing? A. Yes. Q. Are all your men first-class painters? A. The three-fourths of the men go as first-class painters. Q. Have you any wood finishers, who can do French polishing and fuming? A. Yes, I have three of these men.

MR. F. A. COTE (CHIEF ELECTRICIAN).

Q. What is your name? A. Francis A. Coté. Q. How long have you been working in the yard? A. 10 years. Q. How long have you been Chief Electrician? A. I always held the position of Chief Electrician. Q. Where were you employed before coming into the yard? A. I was seventeen years with the Bell Telephone Co. with headquarters in Montreal. I was with Messrs Ahearn & Soper in connection with the Ottawa Street Ry. Co. for three years and after that I was in business for myself in Ottawa in the electric contracting business. It was while on that business in Ottawa that I accepted this position. I may say that my duties here since the last seven months are quite restrained. My position here first was connected with the territory all over Canada. I was sent to Halifax, St. John, N.B., Prescott, Ottawa and other places in connection with all electrical work connected with the Department of Marine & Fisheries. Since Mr. Gourdeau, the late Deputy Minister, retired from the service, it looks as though Mr. Johnson, who replaces him does not approve of my position having that scope, and the result is that I am not consulted any more regarding work outside of Sorel. Q. How old are you? A. 45. Q. What authority have you concerning the employment and dismissal of men? A. I think my authority is very limited. I could not discharge or take on a man. Q. Do you consider all the men employed in your department as permanent employees? A. Well I never looked at that question in that light. My experience has been that with a few men that I have when any attempts have been made to get rid of some of them we have been met with such trouble that we did not dare doing it. Q. What do you do when a man comes late to work two or three times a week? Do you report him accordingly? A. There is such a thing as a man coming late. I have had no cause to find fault with any of the men for the reason that none of them have lost time, but I have officers, two or three superior men, who have to my knowledge lost ten quarter days the last year through coming late but who put in the time. This is wrong. There should be a rule so that a man losing five minutes should not incur the loss of a quarter day. Two men have lost six quarter days and another four during the last month. Q. How many men are absent every day from your department on an average? A. I can put it at one. Q. Do you consider that you have enough men in your department for the work you have to do? A. At certain times of the year I have enough, but at other times I have too many. For instance, there is one elevator dredge that is under construction, and I presume that this will keep us busy until the fleet starts out, that is to say my men will be kept going for a couple of months, but after that new construction work is finished I will have too many men. I have not too many men if we get work as heretofore, but from what I can see now, I am pretty sure that during the next season I will have a few men too many. Q. Do you consider that you have more men in your department than you need? A. No. We are overhauling every boat, dredge and tug. Apart from that we are also overhauling the engines in our mechanical department. My assistant is giving all his time to this and at present we have our hands full. Q. How many men have you employed in your department during the summer? A. The same number as now, that is to say 13. Q. On what work are those men employed during the summer? A. In summer we have tugs and dredges to finish, but it is beginning to appear as if we would not have this work this summer. We have been kept busy with the installation of small isolated plants on small tugs, etc. Q. How do you get a new employee when you need one? A. I have not appointed a man for five years. I apply to the Director and tell him I would like to have an extra hand, and the Director complies. But it is not the most competent man that gets the job. Q. Is a new man ever sent to you when you have not asked for one? A. No. Q. Do they ever send you a new man when you have no work for him? A. No. Q. Are you ever allowed to choose your own men? A. No. Q. Do you consider all the men sent to you as competent for the work of your department? A. Not by any means. The one that has the biggest pull, gets the job. Q. If they are not competent, what do you

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do with them? A. I do the best I can. Q. When a man is sent to you, do you allot him to the work you think him fit for? A. Yes. Q. Do you fix the men's wages yourself? A. I had that difficulty and it lead to quarrelling. Once Mr. Desbarats put me out of his office over that question because I was fighting for a man who deserved an increase of salary. I did not get much satisfaction. Q. Do you report to the Director concerning a new employee before his salary is fixed? A. Yes. Q. When a man comes late to work, does he report to you? A. Yes, on my command they do it. Five or six years ago I threatened men for giving lip when coming late. Since that they are very careful and will give me good excuses. Q. What do you do when a man disobeys you or misbehaves? A. I report him to the Director. Q. Do you keep record of the time a man spends on a job? A. Yes, this is done every morning. Q. Do you place the men of your department on the different kinds of work yourself? A. Yes, I do in the bigger lines, but the minor details are left to my foreman. For instance, the other night we had a short circuit, we had a ground and wanted to take it out, I told DeGrosbois, my assistant, to come back that night early and take whom he liked with him. He came back and the work was done. There are times when I am called away for a month and things go on very well. This man does as well as myself. Q. To whom do you report? A. To the Director. Q. What work have you on hand at the present time? A. The dredge No. 26 and that stone crusher. The best part of my men are busy finishing the fleet. Q. How many men have you employed in your department who are not on construction work? A. One. Q. Who is that man? A. Mr. Thibeau. Q. What is he employed at? A. He keeps the eupboards locked up, keeps tallies, answers the telephone and also hands out the lamps. For instance, we get requisitions from different departments in connection with lamps. The men from these departments do not come to the store here. They give us the requisitions and we immediately give them the lamps, thus saving time. We send no requisitions to the office. Q. Have you a clerk in your department, and what is his work? A. I have no clerk. Q. Who takes your place during your absence? A. Mr. DeGrosbois. Q. Do you punch the time-clock? A. No. I sign the book. Q. Do you report to the timekeeper every day, and if so, how? A. No. Q. Have you any other men in your department who do not punch the time-clock—If so, how is their time checked—How often do you report to the timekeeper? A. No. Q. Do other departments or other officers interfere in what you consider the right way of managing your department? A. Not lately. It happened three or four years ago. People would come for a cut-off conduit, the result was I worked up for one single month an expense of \$78. Q. Have you any more men in your department now than you had last year at the same period? A. I have much less. I used to have 18 men, now I have 13. Q. Have you more work ahead of you this year than last year? A. I have not less. Q. Have you any changes to suggest in the way of managing your department through which you might obtain better work from your men without more expense to the Government? A. Yes, pay my men better and dismiss a few. I would get the same work and the Government would pay less money. Q. Have you any complaints to make? A. No, except what I said above. Q. Are you paid extra for extra work? A. No. My men are paid extra. Q. Have you any men that you would recommend for dismissal in your department for incompetency? A. I do not think so. Q. Are you acquainted with the N.E. Underwriters Code? A. Yes, a little. Q. What are your working hours? A. From half past eight in the morning till five. Q. Do you figure out the size of all dynamos for the fleet? A. Yes. Q. Have you a man trimming lights? A. Yes, not only that; he trims lights and puts in extension cords, etc. Q. Have you the proper authority over men? A. Yes. I may say I have, but this must go under restriction. I may instance that I had two men doing extra work as ordered by me. I met these two men and asked them what they were doing standing and talking that way. They answered that they were talking about their own business. I reported to Mr. Papineau and asked him what to do. I told

him that I wanted to suspend them. Mr. Papineau looked provoked but just as I was leaving the office Mr. Papineau said to me 'Mind that you do not put your foot in it.' That was the end of the matter. Q. Do you give out lamps without returning in old lamps or plugs? A. Yes. I give orders first not to give out lamps without the stub, but we find that it is better to give them at once in order that the work may not suffer.

Mr. L. COFSKY (FOREMAN OF MOULD LOFT NO. 1.)

Q. What is your name? A. Louis Cofsky. Q. How long have you worked in the Yard? A. 18 years. Q. How long have you been foreman? A. I have always been foreman here. Q. Where were you employed before you came into the Yard? A. I have worked 10 years for William Boivin, Contractor Morency, and 7 years for the Richelieu Company, in joiner work. Q. How old are you? A. 53 years old. Q. What authority have you concerning the employment or dismissal of men? A. I have no authority. That is with the Office. Q. Do you consider all the men in your department as permanent employees? A. Yes, they are all permanent men. Some have been here 6 or 7 years, others 13 years. Q. What do you do when a man comes late to work two or three times a week. Do you report him accordingly? A. I make no report. They cannot come late without losing their pay. Q. How many men are absent every day from your department on an average? A. Two or three a week on an average. Q. Do you consider that you have enough men in your department for the work you have to do? A. Yes, I have a sufficient number. Q. Do you consider that you have more men than you need? A. If some work does not come in I consider that I will soon have too many. Q. How many men have you employed in your department during summer? A. 12 or 13. Q. On what work are those men employed during summer? A. Only on the modelling board. Q. How do you get a new employee when you need one? A. I get them from the Director's office. Q. Is a new man sent to you when you have not asked for one? A. Yes. Q. In that case, what do you do with that man? A. I put him to work. Q. Do they ever send you a new man when you have no work for him? A. No, never when I have no work for a man. Q. Are you ever allowed to choose your own men? A. I do not choose them myself. When an incompetent man is sent to me I take him on and show him how to work. Q. Do you consider all the men sent to you as being competent for the work of your department? A. Sufficiently competent for the work of making models which they have to do. Q. When a new man is sent to you, do you allot him to the work you think him fit for? A. Yes, I place them on the right work myself. Q. Do you fix the men's wages yourself? A. No, I do not. That is the office's work. Q. Do you report to the Director regarding the ability of a new man before his salary is fixed? A. Yes, I report to the Director who fixes the wages. Q. When a man comes late to work, do you report him accordingly? A. A man cannot come late because he loses his pay. He can punch at 9.30 but he loses his pay for the time lost. Q. What do you do when a man disobeys you or misbehaves? A. If a man disobeys and refuses work I get the best of him or I send him away. I have never had occasion to send any away for that reason. Q. How can you check the time a man takes for a job, and keep record of it? A. That is very difficult. If a man is delayed in his work on account of the preparation of the wood, etc., it is hard to keep tally of the time spent on his work in particular. I change the men as the different work or jobs require. I put two men here and two men there, and so on. Q. Do you put the men on the different jobs yourself? A. Yes. Q. To whom do you report? A. I have no report to make because, as a rule, everything goes well. I am not asked to report. Q. Whom do you receive your instructions from? A. From Mr. Terreault. Q. What work have you on hand at the present time? A. Different repair jobs to Nos. 26 and 37, and other minor repairs. I have men on board the *Tarte* and on board the No. 6, doing repair work, etc. Q. How many men have you in your department who are not employed on construction work? A. All my men are employed on construction work.

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Q. Have you a clerk in your department, and what is his work? A. Yes. He makes out requisitions. He keeps the men's time, etc. Q. Who takes your place when you are absent? A. Albert Deserre. He is 30 years old. He is well able to replace me, although this very seldom happens. Q. Do you punch the clock? A. No. Q. Do you report to the timekeeper every day, and if so, how? A. The report which the clerk makes of the requisitions every day, of the men's time, etc., is the only report that I make. Q. How often do you report to the timekeeper? A. Every day. Q. Have you other men in your department who do not punch the time-clock? A. All the men punch the time-clock. Q. Do other departments, or other officers interfere in what you consider the proper way of managing your department? A. No. I would not stand for it anyway. Q. Have you more men in your department now than you had last year at the same period? A. I have the same number about. Q. Have you more work ahead of you this year than last year? A. Yes. I have more work. Q. Have you any changes to suggest in the managing of your department, through which you might get better work from your men without any more expense to the government? A. If my men were more capable in tracing their work instead of having to make moulds, they could do more work. Only a good boilermaker would be more expensive and the resulting improvement would not be very great. Q. Have you any complaints to make? A. No. Q. Can you read and write? A. Yes. Q. Are you paid extra for overtime? A. No. My men never do overtime. Q. Have you any men whom you would like to see dismissed, for incompetency, etc.? A. If we had no new construction work we could do without half of our men in a month's time. Q. What are two moulding lofts wanted for? A. One only is absolutely required, but when two tugs come in at once, the work has to be pushed forward. Q. Do you lay down all boats to be constructed on the floor? A. Mr. Badeau does the tracing which is then transferred to the old loft where the work is continued. Q. Do you make templates for every frame and floor in fine ended boats? A. Yes. Q. Do you make templates for shell plating? A. All templates are made in loft except for shells. The conditions in the old loft are not good, the floors are poor and we prefer using the new loft, where conditions are better. We use screw nails and wrought nails half and half in making templates, and when finished the nails are clinched or turned. We have no machinery to assist in making templates. We have low stools in the lofts for making templates.

MR. H. LEGAULT (ASBESTOS FOREMAN).

Q. What is your name? A. H. Legault. Q. How long have you been working in the yard? A. Three years. Q. How long have you been foreman? A. Since I am here, three years. Q. Where were you employed before coming into the yard? A. I was employed for the Richelieu Company and for Mr. Wurtele at Ottawa. Q. What sort of work did you do there? A. I worked in asbestos. I never did anything else. Q. How old are you? A. 48 years of age. Q. What authority have you concerning the employment and the dismissal of men? A. I have no authority. I make a report when I want men discharged. Q. Do you consider that all the men in your department are permanent employees? A. Yes. They were here when I came and they are still here. Q. What do you do when a man comes late to work two or three times a week, do you make a report accordingly? A. They cannot come late without losing one quarter day. If they miss the time clock they miss their pay. Q. How many men are absent every day from your department on an average? A. It is very seldom that any one is missing. Sometimes a man will be absent on account of bad roads, etc., but that is very seldom. Q. Do you consider that you have enough men in your department for the work you have to do? I have enough now, but later on, say towards the end of next week, when the work will be pressing, I will want more men. At certain times, I borrow men from other parts of the yard. Q. How many men have you employed in your department during summer? A. I have six men. Last summer, I had eight for a time. Q. On what work are those men em-

ployed during summer? A. On repairs and preparing stock for the following year. Then getting the cement at the bottom of the boats, etc. Q. How do you get a new employee when you require one? A. I ask the Director for one. Q. Do they ever send you a new man when you have not asked for one? A. No, but I was sent one once who was a mason. That was the only time. They knew I was short of men, and they sent him to me. Q. In that case what do you do with the man? A. I put him to work. As I say above, this happened only once. Q. Do they ever send you a new man when you have no work for him? A. No, never. Q. Are you ever allowed to choose your men yourself? A. There is no choice to make, all my men are labourers. Q. Do you consider all the men sent to you as being competent for the work of your department? A. Yes. Q. When a new man is sent to you, can you put him to the work which you think him fit for? A. Yes. Q. Do you fix the men's wages yourself? A. No. Q. Do you report to the Director concerning the ability of a new man before his salary is fixed? A. No, the Director pays the men according to what the others get. Q. When a man comes to work late does he report to you? A. No. If he comes late, he loses a quarter of a day. Q. What do you do when a man disobeys you or misbehaves? A. That has never happened to me. Q. How do you check the time a man takes to do a job and keep a record of it? A. I am not in a position to check a man's time owing to circumstances. I see to my men three or four times a day and notice how they work. I keep no record of the cost of the work, this is done at the office. Q. Do you put the men of your department on the different kinds of work yourself? A. Yes. Q. To whom do you report? A. I have no report to make. Q. Whom do you get your instructions from? A. From Mr. Papineau and Mr. Terreault. Q. What work have you on hand now? A. I have the dredges and the tugs. Only one at a time. Q. How many men have you in your department who are not employed on construction work? A. They are all employed and at work. Q. Have you a clerk in your department, and what is his work? A. I have a man to make out the orders and deliver the asbestos when needed. That man is sick just now and I am alone for that work. He will come back when he is better. Q. Who replaces you during your absence? A. I am never absent. My man St. Amand would replace me. Q. Do you punch the time clock? A. Yes. Q. Do you report to the timekeeper every day. If so, how? A. No I do not have to report. Q. How often do you report to the timekeeper? A. I never report except when a man is sick, it is the timekeeper who sees to this. Q. Have you any other men in your department who do not punch the time-clock? A. No, all the men punch the clock. Q. Do other departments or other officers interfere with what you consider the proper way of managing your department? A. No, I am never interfered with. Q. Have you more men in your department now than you had last year at the same period? A. I have less. Q. Have you more work ahead this year than last year? A. It is about the same thing. Q. Have you any changes to suggest in the way of managing your department which would give you better work from your men without any more expense to the government? A. My department is not in need of any changes. There is nothing to do to improve the present system. Q. Have you any complaints to make? A. No. Q. Are you paid extra for overtime? A. I very seldom do overtime, but when I do, I am paid extra. Last year I worked about two days overtime. Q. Have you any men whom you would like to see discharged for incompetency? A. No, as I am rather short of men. Q. Do you put all the cement on the bottom of boats? A. Yes. Q. What is the percentage of your cement? A. Two to one for the bottom. Q. What thickness on the bottom? A. One and a quarter inch and one and a half inch. Q. How do you weigh your cement and sand? A. We use buckets as a rule. Q. Is the pipe covering made by you as good as you can buy? A. Yes. Q. How long have they been making pipe covering in the yard? A. Since I am here. Q. Are you making the pipe covering faster than you can use it? A. It takes longer to make it than to put it on. Q. Do you buy any? A. No. Q. Are all boats, tugs and dredges cemented?—A. Yes, all.

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MR. O. GAUTHIER (PATTERN SHOP FOREMAN).

Q. What is your name? A. Ovide Gauthier. Q. How long have you been working in the yard? A. Eleven years. Q. How long have you been foreman? A. About six years. Q. Where were you employed before coming into the yard? A. I was with Beauchemin & Fils at Sorel. Q. What sort of work did you do there? A. Steamboat constructor, furnishings, etc. In the patterns, etc. Q. How old are you? A. Sixty years of age. Q. What is your authority concerning the employment and dismissal of men? A. I have no authority. I report to Mr. Papineau and if I have too many men I ask him if any should be discharged. I have never asked for more men here. Q. Do you consider all the men in your department as permanent employees? A. Yes, they are all permanent. Q. What do you do when a man comes late to work two or three times a week. Do you report accordingly? A. No. That is the time-clock's business. If a man does not punch the clock he loses a quarter day, and I have nothing to say about that. He can start again to work at 9.30. Q. How many men are absent every day from your department on an average? A. My men are very regular. None of them are often absent. Sometimes one or two a week. Q. Do you consider that you have enough men in your department for the work you have to do? A. Yes, for the present. Q. Do you consider that you have more men in your department than you need? A. Sometimes I have too many, at other times, pressing work comes along and I need more men. This is not regular. On the whole I have none too many now. Q. How many men have you employed in your department during summer? A. About the same number as during the winter. Q. At what work are those men employed during summer? A. During the summer there are accidents, breakages, etc., which require repairs, and that is what the men are kept at. Q. How do you get a new man when you need one? A. That has never happened. I have always those I want. Q. Do they ever send you a new man when you have not asked for one? A. That has happened once. Q. In that case what do you do with the man? A. I put him to work. Q. Do they ever send you a new man when you have no work for him? A. No. Q. Are you ever allowed to choose your men yourself? A. I have no choice to make. I have always had the same men. Q. Do you consider all the men who are sent to you as being competent for the work of your department? A. There is all sorts of work for all the men. There are some men for common work, etc. Q. If they are not competent what do you do with them? A. This has not happened yet. When work is slack, I send men to do work in other parts of the yard. Q. When a new man is sent to you, do you allot him to whatever work you think him fit for? A. Yes. Q. Do you report to the Director concerning the ability of a new man before his salary is fixed? A. I don't report, but I ask Mr. Papineau about it. Q. Do you fix the men's salary yourself? A. I refer to Mr. Papineau. Q. When a man comes late to work does he report to you? A. No. The time-clock does that. The man don't need to report to me. If he comes at 9.30 he loses a quarter day. Q. What do you do when a man disobeys you or misbehaves. A. That never happens. I would not put up with it. Q. How can you check the time a man takes to do a job and keep record of it? A. The jobs are numbered and the time spent on it by a man is controlled. If his work is changed, the time-sheet keeps tally of the change. This time-sheet is out in every night. I do not keep any records myself, this is done at the office. Q. Do you allot the men in your department on the different jobs yourself? A. Yes, I give the work myself, the designs, etc., to the men. Q. Whom do you report to? A. To Mr. Papineau. Q. Whom do you get your instructions from? A. From Mr. Terrecault. The work comes from the draughting room and I refer to Mr. Terrecault for an order number to do the work. Q. What work have you on hand now? A. I have general work, repairs to the fleet, etc. New construction on No. 26, the *Portneuf* and the No. 8. Q. How many men have you in your department who are not employed on construction work? A. One man for the care of the shop, for sweeping, etc., and another man to take the patterns to the foundry. He takes the weight according to orders and takes

that to the office. He keeps the numbers of the patterns and takes care of them generally. Q. Who are those men? A. Edouard Bellerose keeps the patterns and William Lirette takes care of the shop. Q. Have you a clerk in your department and what is his work? A. No, I have no clerk. My son, who works at the trade, keeps the time lists and makes the requisitions. Q. Who takes your place during your absence. A. It is my son who is most able. As a rule nobody takes my place, as I am very seldom absent. Q. Do you punch the time-clock? A. No. Q. Do you report to the timekeeper every day, and if so how? A. No, I have no report to make. Q. Have you any other men in your department who do not punch the time-clock? A. No. Q. Do other departments or other officers interfere in what you consider the proper way of managing your department? A. No, nobody interferes. Have you more men in your department now than you had last year at the same period? A. I have about the same number. Q. Have you more work ahead this year than last year? A. About the same as last year. We don't know how the season will turn out. Q. Have you any changes to suggest in the management of your department, which would obtain better work from your men without any more expense to the government? A. No, I have no changes to suggest. I have worked 22 years with Beauchemin and Fils, making their patterns and I know that we cannot push the men to work any harder. They need time to think of their work and do it properly. Q. Have you any complaints to make? A. No, I have no complaints to make. Q. Can you read and write. A. Yes. Q. Are you paid extra for overtime? A. No. My men are paid time and a half when they work overtime, but that is very seldom. Q. Have you any men whom you would like to see discharged? A. No, because I need every one owing to pressing work which might turn up. Q. Do you keep any records of the patterns you have under your charge? A. No. Q. Do you consider the patterns are properly kept? A. Yes. Q. Is not the place too hot? A. No, I think not. Q. What kind of wood do you use? A. White pine. Q. Are your pattern makers all properly trained men, did they serve an apprenticeship? A. No. They never served an apprenticeship, but came and had been trained perfectly. Q. Have you a man in charge of the patterns to see they are not destroyed and to give them out, to keep a record and see that they are returned intact? A. Yes, Mr. Bellerose. He sees to all this, checks and takes care of all the patterns. Q. Are you responsible for the patterns in the storehouse? A. Mr. Bellerose is responsible. Q. Are you supplied with working drawings for making patterns? A. For new work, we get designs from the drawing room. For repair work we use old drawings. Q. Are the drawings well made and correct? A. Yes.

MR. JAMES DEANS (DRAUGHTING ROOM).

Q. How long have you been employed at the Sorel Shipyard? A. A little over four years. I came here in November, 1907. Q. What was your experience before coming here? A. I was working as chief draughtsman with Brown & Co., Clydebank. Q. What are your duties and responsibilities? A. I am mechanical engineering draughtsman. I have charge of drawings, designs, etc. I am responsible for all the drawings in the draughting room. Q. Did you serve an apprenticeship as an engineering draughtsman? A. Yes, I served for seven years with Renfrew, Lobnitz & Co. & Saunada Bros., London, England. Q. Are you chief draughtsman of the Engineering Department? A. Yes. I am chief draughtsman here. Most of the time I am working by myself. Q. How many men have you assisting you? A. None at all at present. Sometimes I have two or three assistants. Q. What are their names and experiences? A. I had one by the name of Deguise, who has been most of his time in the office, seven or eight years. He has had training in correspondence schools. Q. Do you take the full control of the engineering department, get out the drawings and designs for engines, boilers, dredging machinery, pumps, etc., electric lighting, size of the dynamos, steam piping, and bilge arrangements of pumping? A. The

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electric light part I have not much to do with, but I have control of all the rest, dredging machinery, pump auxiliaries, bilge piping, etc. Q. Are you capable of working out the H.P. required, fix size of engines and boilers necessary to attain certain speed? A. Yes. Q. Can you calculate weights of engines, boilers, dredging machinery, etc.? A. Yes. Q. Are you familiar with constants, two-third power for speed rules, centres of gravity, etc.? A. Yes. Q. Are you familiar with the best designs of pumps and engine room auxiliaries? A. Yes, I am quite experienced in that. Q. Can you make your own drawings for boiler and engine room lay-out? A. Yes. Q. Can you draw out your own piping arrangements? A. Yes. Q. Can you produce the necessary drawings for details of cylinders, shafting, bed plates, propellers, and see them all through the various shops? A. Yes. Q. Have you any practical experience in engineering work, can you supervise shop work, erecting and placing on board? A. I never had a position like that. I have worked in shops, about two and a half years and I can give any information wanted in that line. I can go into a shop and see about the work of erecting, etc. Q. On trial trips can you take indicator diagrams and work out speeds, slip, etc., on a measure rule, take note of steam and coal consumption, etc.? A. Yes. Q. Do you understand Lloyd's rules and work out the formulas for making boilers, shafting, etc.? A. Yes. I do. Q. Do you order or make out specifications for ordering pumps and engines, boiler room auxiliaries, ash hoists, etc. A. Yes. I make specifications for the pumps and auxiliaries, engines, etc. Q. Have you had any experience with paddle wheel engines? A. Very little. Q. Have you had experience with turbines? A. Yes. Q. Have you had any experience with oil engines? A. No, I have no practical experience with oil engines. Q. Can you make up estimates of cost of engines and boilers, winches, dredging gear, etc.? A. No, I am not very able to make prices. I have had an idea about making prices for contract work, but I have not done that myself. Q. What data do you keep as to sizes of machinery, boilers, auxiliaries, H. P. developed on trial, revolution, speed, etc.? A. I keep calculations for boiler work, etc., and we keep records of the work I do myself. We never keep sizes of H. P. on trial, revolution, etc. Q. Do you make finished drawings of engines, boilers and auxiliaries and data for future reference? A. Yes, we have drawings. Q. Do you have a book of particulars in which to keep a record of performances, coal consumption per H.P., etc.? A. We do not need to keep that book. No boats that I know do it. This book is not kept. Q. Can you design propellers suitable for the best results of speed towing slip, etc.? A. We keep a second design.

MR. BRIDGES (DRAUGHTING ROOM).

My name is Frederick Bridges.

Q. How long have you been employed at Sorel Shipyard? A. Nearly 4 years. I came in May, 1908. Q. What was your experience before coming here? A. I started as apprentice in 1884, and was 9 years with the firm of Samuda Brothers, London; then I was 3 years out, and from 1895 to 1907 was with another firm in England Edwards Company, on the Thames; then I came out here. Q. What are your duties and responsibilities? A. I came here as ship's draughtsman and I give ideas how to make plans and details, and see that the foremen get these ideas. I have to go in also and see that the work is carried out. I follow the work right through. Q. Did you serve an apprenticeship as ship's draughtsman, where and for what term? A. No, not as ship's draughtsman but as a ship-builder. Q. Have you had any practical experience as a ship-builder? A. I have 3 years' experience in the ships. Q. Have you had charge of any part of the yard work practically, that is, the handling of men? A. Yes, at home. Here, no. I only tell the men what to do. I have no authority. Q. Are you chief draughtsman of the hull department? A. No. I just figure as draughtsman. Q. How many men have you assisting you, what are their names and ability as draughtsmen? A. I have had one, Mr. Houston. He is now in Ottawa.

Before that I was told I could get anybody I wanted. Mr. Houston is a ship's draughtsman. These boys we have in the office are only helps. Mr. Houston has had as long experience as myself. He is about 40 years of age, I think. Q. Are you capable of designing vessels as to form of lines, speed and stability? A. Yes. Q. Are you capable of receiving a specification, stating the requirements, able to fix dimensions, calculate weights, stability, centres of gravity, metacentres, centres of buoyancy, trim, etc.; by approximate rules to insure that vessels on completion will carry the specified dead weight on a given draught of water and be stable? A. Yes, I am able to do all that. That is what I have to do. Q. Can you design vessels on a level water line with a drooping keel? A. Yes, that is what I should do. Q. Can you design vessels in the ordinary way, square off the keel? A. Yes. Q. On completion can you incline the vessel to obtain her centre of gravity and work out curves of stability, statistical, co-efficients, moments of alter trim, moments of inertia, etc.? A. Yes, I knew it but it is a thing I have seldom done. I have only inclined two boats in all my existence, curves of stability, and so on. Q. What is your age? A. I am 44 years old. Q. Do you understand Lloyd's Rules, B.C., and Great Lakes Rules for the building and classification of vessels? A. I understand Lloyd's Rules. B.C. I have never worked. I have worked Bureau Valetes. Q. Can you draw out your own working plans and order material, forgings, spectacle bosses, rudders, etc.? A. Yes. Q. Do you get out plans and specifications for plumber work, heating, ventilation, electric light installation, etc.? A. Yes. I do the work for electric lighting required, for ventilation, etc. Q. Can you order outfits such as anchors, chains, windlasses, winches, electric light work; work out your own sizes for dynamos, steering gear and all usual outfit required for a vessel, such as deck rigging, blocks, etc.? A. Yes. On the *Montmagny* I took charge of all that, worked out dynamos, etc. Q. Have you any experience as to costing and making up estimates for the cost of vessels? A. Yes. Before I came out here I did all the estimating for about 6 or 7 years for proposed vessels. Q. Have you had experience in working out stresses or derricks, mast-mountings, stays, shrouds, etc.? A. Yes. I may say here I have only seen the work, but I can figure the hours and I know the rate of pay. I have never made estimates here at all. I do not know how they arrive at estimates. Q. Are you familiar with the planimeter and integrater? A. Not with the integrater. The planimeter, I use. Q. Can you work out displacements on cross-check system? A. I check my figures by taking vertical sections and horizontal sections. Q. Can you figure out the required I.H.P., to drive vessels at given speed by constant and two-third power, etc? A. Yes. Q. What data do you keep, or what system do you have of keeping record of vessels built, dimensions, weight, scantings, invoice material, rivets, displacement, tonnage, dates of construction, launching and finishing? A. I just keep them all in a portfolio of my own. I take it that I should hand over that data to the yard. I take copies that I want myself. This is not kept in book form, and there is no proper record kept. Q. Do you make finished drawings of vessels built for future reference? A. Yes, when I have time, but we are kept rushed as a rule. I have drawings of No. 21 in pencil and will finish them. Q. Are you capable of taking charge of the moulding loft? A. Yes. Q. Are you capable of taking charge of construction of a vessel in all departments? A. Yes. I can take hold of men and build a boat. Q. Have you had any experience of repair work? A. Not very much. The yards on the Thames do little repair work but mostly new work. Q. Have you had any experience in making up the cost of repairs? A. No. I have not.

MR. JOSEPH P. HEREX (CHIEF DRAUGHTSMAN).

Q. How long have you been employed in Sorel shipyard? A. 6½ years. Q. What was your experience before coming here? A. I was a contractor. I also did work for building contractors. Q. What are your duties and responsibilities? A. I am chief draughtsman. I have to look after all the draughtsmen except two experienced per-

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sons, Mr. Bridges and Mr. Deans. I give work to do to all the others. There are 8 draughtsmen and I have to look after them. I do drawing myself. Two years ago we made steel frame work for the boiler shop and cars for the Railway Department, and I supervised all that work. Q. Did you serve an apprenticeship as an engineering draughtsman? A. Yes. Q. Where, and how long did you serve? A. I am a civil engineer from the Polytechnical School in Montreal. I graduated in 1885 as a civil engineer. Q. Are you chief draughtsman of the engineering department? A. Yes. Q. How many men have you assisting you? A. Generally I have 10. With myself we are 11. I have two experts. Q. Who are they and what is their experience? A. One is a civil engineer, draughtsman; the other is a blue-print man. Q. Are you capable of designing vessels as to form of lines, speed and stability? A. Yes. Since 6 years I worked in ship building. -I lately took the No. 36 and No. 38, and I supervised all the designs which were made in the draughting room. Q. You have had experience in building? A. Yes, I was a contractor for 6 years. I never had experience in reinforced concrete. I have made foundations for many big buildings, churches, etc. Q. How old are you? A. I am 40 years of age. I am a member of the Canadian Society of Civil Engineers.

MR. J. U. LATRAVERSE (COST DEPARTMENT).

Q. What is your name? A. J. U. Latraverse. Q. How long have you been working in the yard? A. 5 years next June. Q. How long have you had charge of your department? A. Two years now. Q. Where were you employed before coming to the yard? A. I worked for L. Chaput, Son & Co., Montreal. Q. What kind of work were you doing there? A. At certain times I was in the correspondence department; then I had charge of the collecting ledger, and I was the invoice clerk. Q. What is your age? A. I am 27 years old. Q. What authority have you regarding employing and discharging men in your department? A. I have very little authority. I cannot proceed by myself. I have to report to the Director if anything does not go right. I can get a man discharged this way. This happened a year ago, when a man was not giving satisfaction and I had another man take his place. Q. Are all the men in your department permanent employees? A. No. Q. When a man comes late two or three times a week what action do you take? A. The first time I tell him, the second time and the third time we take note of it and it is taken out of his holidays. Q. Do you have much inconvenience in your department from men being away? A. No. Q. Do you consider your present staff large enough to handle the work in your department? A. Not with the system we have. I think the chief accountant in Ottawa will have to make some changes with regard to the system here, to have the department's work clearer. With the present system, I have to go into two or three different places to find the cost of work, and this should be changed so that the cost could be had at once and together. Q. Do you consider your present staff too large for the work you have to do? A. No. We have about the number of men we need. Q. Do you keep the same number of men in your department the whole year around? A. For the last year we have had the same number, although at times we have so much work that I have to get a man from the other department for 2 or 3 days. Q. What do these men do during the summer months? A. They keep the cost of new construction. We have less repairs to keep track of, but there is always something to do. Q. During the summer months have you enough work to keep your whole staff busy? A. This depends on circumstances. Sometimes for 2 or 3 weeks perhaps, the men will not have much to do, then 2 or 3 weeks after, the work rushes in and we are in great need of more men. It would not be wise to lay any off. Q. Do you ever have a new man sent to your department without asking for one? A. Do you mean if I get a new man without asking the Director for one? I have to ask the Director. I

never had a man sent to me without having work for him to do. Q. Are you allowed to choose your men? A. No, if I want a new man I have to ask the Director. Q. Do you consider all the men sent to you qualified for your work? A. Yes. They are qualified now. At the beginning I had one who was not qualified but he did not take long to become so. Q. Do you look into their qualifications? A. When they come I give them a certain kind of work to do and if they cannot do it, I realize they are not qualified, and I have to keep trying them until they can be of use. Q. When a new man is sent to your department can you place him at what kind of work you see fit? A. I have not tried that yet, but I can place a new man anywhere I choose. Q. Do you fix the rates of pay in your department? A. No. When they come in the Director asks me about their ability, I make a report and he fixes the salaries. The same thing is done for an increase. I have no choice in fixing salaries. Q. What do you do if a man does not do as you tell him, or misbehaves? A. That has never happened that a man is not willing to do what I ask. If he did I would report him to the Director, and tell him all about that man. Q. Whom do you report to? A. Last year I was reporting to the chief accountant because he wanted me to tell him everything about my department. When he was not in I would report to Mr. Papineau. The new accountant never asks me anything about the department, so I report to Mr. Papineau every time. Q. Who do you get your instructions from? A. From the Director, the superintendent and the chief accountant. Q. Who takes your place when you are absent? A. The ledger keeper, Mr. Prudhomme, but nobody did it so far. In fact I have really no man to take my place. Q. Do you sign the book? A. Yes. Q. Have you any interference from any other department or officials with what you consider the proper running of your department? A. No, nobody has ever interfered. Q. Have you more men in your department now than you had at this time last year? A. Yes, I have one more. Q. Have you any more work to do now than at this time last year? A. I have much more this year. Q. Have you any changes to suggest in the running of your department by which you can get better work out of your men without additional expense to the government? A. I consider that a change suggested to have the system clearer, in order not to lose time when looking up the cost of something, and to have all that comes in a job filed together, would be a good change. I had a mind to begin that system at the beginning of the year in April next. Q. What system of cost keeping do you have as to new constructions? A. For new construction, I receive orders from the superintendent to open an account for such and such a job, and I have all that is required on this job, men, etc., charged to the job, and at the end of the month, the pay-lists are balanced and I have the direct cost of the job. This account is open until the work is through. Q. Can you by turning up your books quickly tell the cost of construction of hulls, engines, boilers, winches, pumps, weight and cost of steel material, rivets, wood, and carpenters' and joiners' outfit? A. Yes, we can have that but I have to look all through my books to get at it. For the cost of a boiler, it is not very long to get it, but to have all details written, would take longer because our entries are very extensive. Q. Have you any system of tabulating the weight and cost of steel plates, angles, tees, Z bars, channels, slips, rivets, etc., weight and cost of production in general? A. No. We do not keep tables at all. Q. Do you keep separately the labour cost of platers, rivetters, caulkers and drillers on ship and machinery construction? A. I can get the work done by the machinists and by the boiler makers in detail. Q. How is foremen's time charged? A. Foremen are charged to the maintaining of their shop, except three or four, and we divide their time they are working on job numbers themselves and we add a percentage to the cost. Q. How do you keep the cost of joiners' and cabinet makers' labour? A. It is divided and kept separate. I have a column for the cabinet shop or for the carpenter in the ledger, where I post all charges for construction. When it is for machinists, it is posted in the column for machinists, etc. Q. How do you keep the cost of joiners' and cabinet makers' materials? A. When the men want wood out of the shop they make a requi-

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sition and the wood is charged to such a job number. Q. How do you keep the cost of ironmongery? A. The blacksmith's shop takes orders and we note every job, the clerk makes requisitions for, etc. Q. Do you get the requisitions from the store-keeper every day and are they up to date? A. We get requisitions the day after they are made. Q. How many days are the requisitions behind hand at present moment? A. Perhaps a day or two. Q. Where do you get your cost of materials from? A. I get it from the store-keeper. Q. Do you keep records of cost of all outfits, beddings, etc.? A. Yes, we keep a record of all the goods on a new boat. Q. What do you charge the repairs to outfits against, viz.: Life belts, mattresses, cooking utensils, etc.? A. We issue a number for each of them. We issue those numbers every year for the operating of the boat, which run the whole year and everything is kept on those numbers. Q. What are your duties and responsibilities? A. My responsibility is to keep cost properly. When I notice something charged on a job which is not proper, I notify the party accordingly, and if there is no change, I report to Mr. Papineau, who sees about it himself.

MR. LANGLOIS (STEAMFITTER FOREMAN).

Q. What is your name? A. Joseph Langlois. Q. How long have you worked in the yard? A. Since last June. Q. How long have you been foreman? A. Ever since I came here. Q. Where were you employed before coming into the yard? A. With the Richelieu Company. Q. What sort of work did you do there? A. All the kind of work in my line generally. Q. How old are you? A. Forty-eight. Q. What authority have you concerning the employment and dismissal of men? A. No authority whatever. It is the Director who takes and dismisses the men. Nevertheless, Mr. Papineau tells me that if anybody does not go right that he will see to it. Q. Do you consider all the men in your department as permanent employees? A. Those who are here have been employed for a long time and I believe them permanent. Q. What do you do when a man comes late to work two or three times a week. Do you report him? A. This has not happened since I am here. Q. How many men are absent every day from your department on an average? A. Perhaps one in a week, other times none at all. Q. Do you consider you have enough men in your department for the work you have to do? A. Yes, for the present. Q. Do you consider you have more men than you need? A. Certainly not. Q. How many men were employed in your department during summer? A. I don't know, I was not here last summer, but I believe we keep the same number. Q. How do you get a new man when you need one? A. I do not need to ask for any, the men come themselves to seek employment with letters from the deputies, etc. Q. Do they ever send you a new man when you have not asked for one? A. No. Q. Do they ever send you a new man when you have no work for him? A. No. Q. Are you ever allowed to choose your own men? A. This has never happened. Q. Do you consider all the men sent to you as competent for the work of your department? A. Those I have had until now are competent. Q. When a new man is sent to you, do you allot him to whatever work you like? A. Yes. Q. Do you fix the men's wages yourself? A. Yes. Q. Do you report to the Director regarding the ability of a new man before his salary is fixed? A. The Director is asked to fix the salary. Q. When a man comes late to work, does he report to you? A. The time-clock sees to this. If he comes at 9.30 and punches the clock and starts to work he loses a quarter day. Q. What do you do when a man disobeys you or misbehaves? A. I have not yet had occasion to act, but I would not put up with a man who would disobey me. I would report him at once to the Director. Q. How can you check the time a man takes to do a job, and keep a record of it? A. I cannot keep any record. This is according to the work he has to do and I have to use my own judgment to see that a man works as quick as possible. Q. Do you allot the men of your department to the different sorts of

works? A. Yes. Q. To whom do you report? A. I report to the office. Q. Whom do you get your instructions from? A. From the office. Q. What work have you on hand now? A. I have all the pipe connections to make for the boilers and all tin-smith work for the whole of the fleet. Q. How many men have you in your department who are not employed on construction work? A. I have an apprentice and I use him as a clerk. Q. Who is that man? A. Adrien Jaures. Q. What is he employed at? A. He makes the requisitions, keeps the men's time, sees to the tools, sweeps the shop, etc. Q. Who takes your place when you are absent? A. I have three men who can replace me, one Bachand, who has 19 years experience, one Champagne and one Langlois, who are also experienced men. Q. Do you punch the time-clock? A. No. Q. Do you report to the timekeeper every day, and if so, how? A. No, I have never been asked to do so. Q. Have you any other men in your department who do not punch the time-clock? A. No, they all punch the clock. Q. Do other departments or other officers interfere in what you consider the proper way of running your department? A. No, never. Q. Have you more men in your department now than you had last year at the same period? A. I cannot say. Q. Have you more work ahead than you had last year? A. I cannot say. Q. Have you any changes to suggest in the running of your department by which you could get better work from your men without additional expense to the Government? A. All the changes possible I have made myself for the better. The men of the shop are of opinion also that things are for the best. Everything runs now as well as possible. Q. Have you any complaints to make? A. No. Q. Can you read and write? A. Yes. Q. Are you paid extra for overtime? A. No, the men are paid extra at about the usual rate. Q. Have you any men whom you would like to see discharged on account of incompetency? A. No, I have none that I would like to have dismissed. If any should leave, they would do so of their own accord. Q. Do you do all the piping work? A. Yes, all that is required is done here. Q. Do you make all piping bends as per drawings? A. Yes, all is done here. Q. Do you do all the pipe covering? A. This is done by Mr. Legault, a special man. Q. Do you see to the repairs to plumbing, etc.? A. Yes. Q. Do you speak English? A. No.

MR. LACOUTURE (CHIEF ACCOUNTANT).

Q. What is your name? A. Louis Lacouture. Q. How long have you been working in the yard? A. Since the 2nd January, this year. Q. How long have you had charge of your department? A. Since I am here. Q. Where were you employed before coming into the yard? A. I was part owner and manager of the Canada Navigation Company. Q. What kind of work were you doing there? A. I had the managing of the business. Q. What is your age? A. 54 years of age. Q. What authority have you regarding employees and discharging men in your department? A. I have none at all. Q. Are all the men in your department permanent employees? A. I dare say they are all permanent. Q. What do you do when a man comes late two or three times a week? A. This is brought to Mr. Papineau's knowledge. Q. Do you have much inconvenience in your department from men being away? A. No although once I found out there was a man who was absent, giving as a reason that he was sick and I had to remind him that Mr. Papineau had told me he was the party to look to for leave of absence. Q. Do you consider your present staff large enough to handle the work in your department? A. Yes, it is sufficiently large and I would not take on any more. Q. Do you consider your present staff too large for the work you have to do? A. With my experience here, I cannot say there are too many but I am sure there are enough. Q. Do you keep the same number of men in your department the whole year around? A. I do not know, I cannot say. Q. What do those men do during the summer months? A. I cannot say. Q. Have you enough work during summer months to keep your whole staff busy? A. I cannot say. Q. Do you ever have a new

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man sent to your department without asking for one? A. I never had any. Q. How do you get a new man when you need one? A. I would have to apply to the Director of the shipyard. I think this is the only way. Q. Do you ever have a new man sent to your department when you have no need of one? A. No. Q. Are you allowed to choose your own men? A. It does not seem so. Q. Do you consider all the men sent to you qualified for the work in your department? A. From what I know now they are. Q. Do you look into their qualifications? A. I have not so far. Q. If you consider a man is not qualified for work what do you do with him? A. I would report him to the Director, because just now I have no authority towards hiring or discharging the men. Q. When a new man is sent to your department, can you place him at what kind of work you see fit? A. No, Mr. Papineau sees to that. Q. Do you fix the men's rate of pay in your department? A. No, I do not. Q. How is the rate of pay fixed? A. Mr. Papineau sees to that. Q. What do you do if a man does not do as you tell him or misbehaves? A. I report him to Mr. Papineau. Q. Whom do you report to? A. To Mr. Papineau directly. Q. Whom do you get your instructions from? A. I am supposed to get them from Mr. Papineau. Q. Who takes your place when you are absent? A. My assistant, Mr. Olivier Cardin. Q. Do you sign the book? A. Not always. Q. Have you any interference from other departments or officials with what you consider the proper running of your department? A. No, I never have any interference. Q. Have you more men in your department now than you had at this time last year? A. I think it is just the same. Q. Have you any more work to do now than this time last year? A. I don't think there is any more. Q. Have you any changes to suggest in the running of your department by which you can get better work out of your men without additional expense to the government? A. This is a question that we have been debating with Mr. Papineau about changing the way of keeping track of the direct cost; that is, I would suggest that every department would have their own accounts, with each a general ledger in which all expenses, wages, materials, maintenance of shop, and other accounts would be entered separately. This would take no more men, would reduce the work and have better results. Q. Do you know when the books were last audited? A. I do not know. Q. Do you check all payments? A. Yes. Q. Do you know whether prices stated on invoices are correct or not? A. No, this is outside of my control. Q. How do you handle your petty cash account? A. We have an advance from Ottawa of a certain amount on which we issue cheques to make petty disbursements according to Mr. Papineau's requirements. Q. Who handles petty cash accounts? A. Myself alone. The petty disbursements accounts appear under Mr. L. J. Papineau and Mr. Lacouture. We have an advance of \$1,000, and up to now I think there is about three or four hundred dollars disbursed. We balance the account once a year and whatever balance is left, we credit the treasurer and a refund is made to the receiver general at the end of the fiscal year. Then we start a new account.

MR. CHAMBERLAND (STOREKEEPER).

Q. What is your name? A. H. C. Chamberland. Q. How long have you been working in the yard? A. Two months, I commenced on 22nd January last. Q. How long have you had charge of your department? A. Since I am here. Q. Where were you employed before coming into yard? A. For the last ten years, I have not done any regular work. I was speculating on property in Montreal, buying and selling. Q. What is your age? A. I am 56. Q. What authority have you regarding employing and discharging men in your department? A. I have no authority at all. Q. Are all the men in your department permanent employees? A. Yes. There are two that were hired just for the stocktaking, Mr. Cardignan and Mr. Bourgeois. They will be laid off when the stocktaking is over according to Mr. Papineau. Q. What do you do when a man comes late two or three times a week? A. We generally commence work

at 8.30 in the morning. I am here when the men arrive. They sign the book. I think they are on time always since I am here. Q. Do you have much inconvenience in your department from men being away? A. No. Q. Do you consider your present staff large enough to handle the work in your department? A. Yes, I think so. Q. Do you consider your present staff too large for the work you have to do? A. Not for this time of the year. Q. Do you keep the same number of men in your department the whole year around? A. I am quite strange to the business and I do not know whether the number of men is the same or not. Q. Do you ever have a new man sent to your department without asking for one? A. No. Q. How do you get a new man when you need one? A. I was to have an assistant when I came here through the deputy, but I did not ask him. I have to go to Mr. Papineau to get a new man. Q. Do you ever have a new man sent to your department when you have no need of one? A. No. Q. Are you allowed to choose your own men? A. No, I don't think so. Q. Do you consider all the men sent to you qualified for the work of your department? A. Yes, I think they are all right. Q. Do you look into their qualifications? A. No. Q. If you consider the man is not qualified for work what do you do with him? A. If I found a man unqualified I would make a complaint. Q. When a new man is sent to your department, can you place him at what kind of work you see fit? A. I cannot do that myself, Mr. Papineau does that. That is what he has done since I am here. Q. Do you fix the men's rate of pay in your department? A. I have nothing to do with that. Q. How is the rate of pay fixed? A. Mr. Papineau does that. Q. What do you do if a man does not do as you tell him, or is misbehaving? A. In that case I would advise Mr. Papineau. I only once had trouble about a man smoking. I reported to Mr. Papineau who gave the man notice that he would turn him out if it happened again. Q. Whom do you report to? A. Mr. Papineau. Q. Whom do you get your instructions from? A. I get instructions from no one. I get orders from Mr. Papineau first and he is my chief. Q. Who takes your place when you are absent? A. No one. Q. Do you sign the book? A. Yes, I sign the store book. Q. Have you any interference from other departments or officials with what you consider the proper running of your department? A. No, nothing of the kind. Q. Have you more men in your department now than you had at this time last year? A. I was not here. Q. Have you any more work to do now than this time last year? A. I was not here. Q. Have you any changes to suggest in the running of your department by which you can get better work of your men without additional expense to the government? A. Yes, there are too many branches in this department. All the clerks are apt to go into corners out of the way places, so I think it would be better to put a man in charge of each department. Take the supply department, for instance. A man should be put in charge of this department during summer. We have one for the winter, but he is discharged in the spring. Requisitions come in and a tally is kept of goods going away only in one room. A man should be kept on all the year round to take charge of that branch and be responsible. When goods are delivered to captains to replace destroyed or broken goods, the broken pieces, etc., should be returned. Q. What are your duties and responsibilities? A. When I came here, Mr. Papineau said there was about \$200,000 worth of stock. He said: 'You and I are the responsible men for the whole stock.' I told him that my pay was only \$80 a month, and that it was too much responsibility for the money. He said he could not do any better. I think I am not paid enough. Q. How many men have you under you? A. Sixteen at the present time, that is men, and two women. Q. Are you responsible for all materials supplied to the yard? A. It is as I have told you before. I am responsible. Q. Do you keep your stock books up to date day by day? A. Yes, day by day, and up to date. The material given out yesterday was all entered in the books. There may be a few requisitions at the end of the day left in the books, but as a rule all is entered. Q. Do you send requisitions to cost department each day? A. Yes, as soon as they are entered in the book they go to that department as far as I know. Q. Are all materials entered

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on book same day as received? A. I cannot answer to that now. Q. How do you figure out the overhead charges of your department? A. There is no percentage added to the cost coming in. This is not my work. Q. Do you consider your stock too large? A. Not so far as I can judge. I have only been here two months and I am too busy to find out. Q. Are any stores given out at night? A. Not after six o'clock. Q. Do you check all goods as being up to samples when bought that way? A. Yes. Q. Do you have a sample here to check by? A. Not always. We have the same stock in hand and make comparison. Sometimes we send the samples to Ottawa, but this goes through Mr. Papineau. Samples are not returned to me because I do not send them myself. I do not know whether Mr. Papineau gets the samples back. Q. Who checks all these goods? A. Mr. Mayer. Q. Is he directly under your charge? A. Yes, he is under my charge. Q. Is he capable of telling when goods are up to samples or specifications? A. Yes, he can do that. Q. If he is in doubt whom does he consult? A. He comes to me, sometimes to Mr. Papineau, and sometimes to Mr. Terreault. Q. If goods are not same as samples or specification, what does he do? A. We consult with Mr. Papineau and he arranges the matter. Yesterday we had something wrong, we sent an order for crockery and they sent it, but on the invoice they had plain white granite. They had made a mistake. I told them to accept it and that the matter would be looked into. Q. If he reports to you what action do you take? A. I generally consult Mr. Papineau over such things. Q. When any goods, which have been charged out against a construction are returned to stock, do you credit the construction with these goods? A. They generally only take what they want. I have never heard of anything being brought back. Q. Do you order all goods for stock? A. Yes, I do all the ordering. Q. Have you any minimum quantity fixed for the amount of certain goods in stock? A. No, we have to go by our own judgment in this. Q. Can you tell from your books just how much of each material is in stock? A. Yes. Q. When was stock taken last? A. I do not know. Q. Do you know what value was placed on stock then? A. I do not know. Q. Have you any idea of the value of the present stock? A. None at all. Q. Is any material ever given out of stock without a requisition? A. No, never. Q. Is there any material so placed to which access could be obtained without your knowledge? A. Yes, there are lots of places like that. The clerk comes here, takes the key, goes to the shed and takes out what he wants, and the man may go there and take things and I would not know. There is a watchman looking after things. Q. Do you consider that any material could be bought cheaper than at present? A. No, I think the prices are pretty fair. Q. Do you consider the present method of buying material satisfactory? A. I have never thought about the matter. Q. Do you check all invoices as to prices and extensions? A. Yes. Q. Does anybody else check these invoices? A. Yes, Mr. Lacouture checks the invoices. He knows prices the same as myself. He keeps all the orders. We have four copies of the invoices and of the orders, I have one, he has one, we send one to Ottawa, and I don't know what becomes of the other. Q. What do you do with the invoices after checking? A. They are sent up to Mr. Lacouture.

MR. LUSSIER (TIMEKEEPER).

Q. What is your name? A. Alfred Lussier. Q. How long have you been working in the yard? A. Since last June. Q. How long have you had charge of your department? A. Since I am here. Q. Where were you employed before coming into the yard? A. I was manager and bookkeeper of 'Le Sorelois,' at Quebec for 23 years. Q. What is your age? A. I am forty years. Q. What authority have you regarding employing and discharging men in your department? A. No authority at all. That is under the Director's authority. Q. Do you consider your present staff large enough to handle the work of your department? A. There would be room for another man. By working very much, we get through the work, but my assistant is obliged to work

at night. Q. Do you fix the men's rate of pay in your department? A. No. Salaries and increases are given by Mr. Papineau. Q. Whom do you report to? A. To Mr. Emery, the paymaster, Mr. Champagne and the Director himself. Q. Whom do you get your instructions from? A. Always from Mr. Papineau. Q. Who takes your place when you are absent? A. My assistant, Mr. Boucher. Q. Do you sign the book? A. Yes, always and so does my assistant. Q. Have you any interference from other departments or officials with what you consider the proper running of your department? A. The paymaster comes now and then to look at my books. We are responsible for the same office, and he does not meddle with giving orders. Q. Have you any changes to suggest in the running of your department by which you can get better work from your men without additional expense to the government? A. I claim that the books at my disposal are not of the proper size. For instance, the present book of the employees is not wide enough. One of the larger size, about the size of that used for the fleet, would suit better. Also we are rather cramped for space and I would like to have a private office and also a waiting room, and a room for my assistant. We would also require a spare room in case of accidents where the sick and wounded might find accommodation. Q. What are your duties and responsibilities? A. I have to keep the men's time, prepare the pay-sheets and see that order is kept in the yard. I also see that the men are well treated. I provide all the stationery for the offices here. I also keep a stock of drugs which requires a good deal of attention in case of accidents, etc. Q. How many men have you under you? A. Two, a messenger and my assistant. Q. Are you responsible for the time of all the men in the yard? A. Yes, I am responsible. All the reports are made by the time-clock keeper. Every morning I have to check his report. I have to see that those who punch the clock at 9.30 are deducted for a quarter day. The same thing in the afternoon. Q. Do you keep the time of the office staff? A. Those who are paid by the day only. The others sign the presence book, which is sent to Mr. Papineau. Q. Are you responsible for keeping the time-clocks in proper working order? No. Mr. John Hayden has charge of them. Q. How often do you inspect the clocks? A. The clocks are inspected twice a week but almost daily by Mr. Hayden who is supposed to make his report every day. Q. Do you see that all the clocks are keeping all the same time? A. Mr. Hayden sees to that. Q. If one clock should be five minutes ahead of the others, what do you do? A. I have never noticed the clocks being fast or slow. Q. Is all the time kept from the time cards? A. Every morning at seven o'clock a watchman reports those absent which we enter in our book. We check the time cards in case of absence, when a man is not satisfied with his time. Q. Do you ever have any trouble reading these cards? A. Sometimes the ribbon in the clock is defective. We can always make out the cards but sometimes they are not very legible. Q. What time in the morning does the boy come to give out the keys to clock men? A. At seven o'clock in the morning he hands them over to my assistant here who enters them immediately in the book. Q. What happens if the boy does not come in. How would the men get the keys? A. The watchmen come and get their keys themselves. Q. At what time in the morning and at noon do the clock men open and close card boxes? A. The clocks are supposed to be opened at 6.40 in the morning and they are closed at seven. Again they are opened at 11.55 at noon and closed at 12 sharp. They are closed for good at six o'clock at night. Q. Do they always return the keys to you? A. Yes, they are always returned each to its proper place. The same thing in the evening. Q. Do you keep any record of time the keys are returned to you? A. No. The men are anxious and come regularly with their keys. Q. When there is any complaint from the men regarding their time, do they come to you? A. Yes. We discuss the matter together and check their cards with the clock. Q. Do you make up the pay-roll? A. Yes. Q. Who checks it? A. It is first checked by Mr. Emery, then by the paymaster and the Director. Q. How is it checked? A. We make out the time shown as put in by the men, and on the report

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of the watchman who checks with Mr. Emery and we send the pay-list to Ottawa in duplicate. This pay-list is signed by the Director and Mr. Champagne and we pay by cheques.

MR. EMERY (DIRECTOR'S SECRETARY).

Q. What is your name? A. Henri Emery. Q. How long have you been working in the yard? A. Fourteen years next July. Q. How long have you had charge of your department? A. Since I am here. Q. Where were you employed before coming into the yard? A. I was in the wine business at St. Roch de Richelieu, manufacturing and selling wine. Q. What is your age? A. Forty-nine. Q. Do you consider your present staff large enough to handle the work in your department? A. Hardly large enough. We have a heavy department and my boy has to make up the pay-lists. All the other departments are grouped around mine and I have some trouble at times. I think another man would be wanted. I have no regular typewriter and I would require one. Q. Whom do you report to? A. To Mr. Papineau. Q. Whom do you get your instructions from? A. From Mr. Papineau. Q. Who takes your place when you are absent? A. There is nobody, but I am very seldom away. In fact I have not been absent for 14 years. Q. Do you sign the book? A. Yes. Q. Have you any changes to suggest in the running of your department by which you can get better work from your men without additional expense to the government? A. There should be a change in our having to do the work of the different departments. I want more help and I would like to have a typewriter. Q. What position do you hold? A. I am secretary to Mr. Papineau. I have passed the examinations in 1897. Q. What are your duties and responsibilities? A. My duties are to attend to the correspondence, keep the files, check the pay-lists, keep track of all recommendations, with which we have great trouble. We sometimes get 20 or 25 letters of recommendation in a bunch. We keep the men's record cards, when men are going away, when they are increased, etc. We have about 25 different indexes to keep about men's letters, requisitions, etc. I have to check all requisitions. I take the requisitions and when they come back I make three copies of each one. Q. Do you attend to all correspondence? A. As secretary I do. Mr. Terreaux sometimes reads letters but I write Mr. Terreaux's letters as well as keep copy of all the official correspondence. Q. How many men have you under you? A. I have one boy. Q. Do you check over the men's time? A. No. I check the lists to see to the correctness of figures. Q. Do you check the pay-lists? A. Yes. I check the pay-lists to see that everything corresponds. Q. Do you check any invoices as to prices and extensions being correct? A. No, that is the accountant's business. Q. Do you keep any records of attendance of the men in the offices? A. Yes, we have a regular book where the officers sign. Q. How are the men's rates of pay fixed? A. That is Mr. Papineau's own privilege at the suggestion of the foremen. Q. Is a man rated as soon as hired, or after he works a few days, and then according to his ability? A. As a rule, a salary is given to begin with to see what the man can do. Sometimes the men are recommended by foremen for an increase of salary. Q. Do you keep a complete record of all correspondence? A. Yes, of every letter, document, etc. Q. Do you keep a complete record of all requisitions for material? A. Yes, a complete record. Q. Are you advised when a requisition is filled? A. Generally the checker gives copies of requisitions, and when they are filled, he brings them back, we attach them to the orders and compare both to see if everything is all right. We compare them to see if the goods are as asked for in the requisition. Q. Do you keep a record of the requisitions as returned from Ottawa? A. Yes, a complete record is kept. Q. Do you keep any records as to the cost of different materials? A. No, I do not keep a record of that. Q. What does your assistant do? A. My boy does typewriting, he keeps different accounts and he helps me to keep the files. Q. How long has he been here? A. Six years. He is a good little boy. Q. Did you do the same work for Mr. Desbarats? A. Yes. Q. Were conditions in the

office the same in Mr. Desbarats' time as at present? A. We have more work now than then. The work is developing all the time. Q. Do you know if any men have been discharged recently for any other than political reasons? A. No, I don't know, I think they were all discharged for political reasons. Q. Do you know if any men are ever taken on when not needed, because they have letters from members of parliament? A. I would not say there are, but the pressure brought to bear is very hard. It takes a man like Mr. Papineau to resist that pressure. The same trouble has always existed. Q. Do you know if all men having letters are given work? A. No. I have all letters in my drawers. We would have to double the shipyard to give all the work asked for. Members of Parliament come from different counties with lists of five, eight and ten men, and fight between themselves about getting positions for their men. About a month ago a member insulted Mr. Papineau because Mr. Papineau would not take on his men. That deputy said to Mr. Papineau, 'You will be kicked out of this.' Q. The painters that were discharged and were taken back again, were all the same men that came back? A. Of course, the paint work generally begins in the spring, and we have not so much work during winter. So in February there was very little work and those men were discharged. I do not remember exactly the number. That was this year. They were not discharged for political reasons, but because there was no work to keep them on. Two weeks ago they were taken on again. Q. Do orders ever come from Ottawa to discharge a man? A. No. In the case of there being no work it is left to Mr. Papineau's orders. The deputy minister sends letters sometimes to say that so-and-so must be discharged, but no reason is given.

MR. TERREAUULT (ASSISTANT DIRECTOR).

Q. What is your name? A. N. H. Terreault. Q. How long have you been employed in Sorel yard? A. Ten years. Q. How long have you been assistant director? A. Three years. Q. What are you professionally? A. I am civil engineer, a graduate of the Polytechnical School of Montreal, I was three years draughtsman with the Phoenix Bridge and Iron Works, Montreal. Also with the Cambria Steel Co., of Johnston, Penn., U.S.A., also with the General Electric Co. of Schenectady, New York, and Municipal Engineer in Vanier's office, Montreal. Q. What are your duties and responsibilities? A. I see to the execution of the work under the direction of Mr. Papineau, and I understood from Mr. Desbarats that I was to act as consulting engineer for the fleet alterations, but one day I heard Mr. Papineau say he was the consulting engineer. I am not directly responsible for repairs. The fleet is not under me, but I look after the repairs. Q. Do you take direct charge of the drawing office staff, approve dimensions of vessel building, fix sizes of engines, boilers and auxiliaries, supervise the designs, as to form of lines, details of construction, stability, carrying capacity, scantlings, etc.? A. Mr. Papineau has all that responsibility, but I believe he holds me responsible if any mistakes are made. Q. Do you personally supervise the construction of hulls, machinery auxiliaries, etc.? A. Yes. Q. Do you engage heads of departments, foremen and workmen and discharge them personally? A. No, I have nothing at all to do with the engagement or discharging of the men. Q. Do you supervise the launching of vessels, hauling boats on slips, etc.? I do supervise the launching of vessels. Q. What is the heaviest boat you can slip? I believe we can dock 1,200 tons. Q. Do you take stock annually? A. I have nothing to do with stock-taking. Q. Have you at any time made valuation of the yard, appliances, tools, buildings, etc.? A. No. Q. Do you make an annual report of the work done, work on hand and money spent for Ottawa? A. Mr. Papineau does that, but I am supposed to help him. Q. Do you ever compare the amount of work done with the expenditure of the yard, to find out if the work has been carried on economically? A. No. Q. Do you make up the cost of proposed new vessels before hand? A. I make a rough estimate according to the old construction we had before. Q. Do you keep proper track of the

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cost at various periods during construction, so as to be able pick up any leakage? A. Yes. We have information from the cost department several times during construction. I had that last week. Q. On completion of the vessel do you compare the actual cost with the estimate and the time taken to build? A. Not in a special way. When a boat is finished that is all there is to it. Q. What are your daily duties? A. I send orders to each department for the work that has to be done during the day. If material is to be ordered for the construction, I see that the lists are made and sent to Mr. Papineau. I go ahead and order, and keep a memo. on my table. Q. What are your hours of attendance at the yard? A. I stay here at all times, every evening until ten o'clock very often. I am telephoned at the house during summer at almost any time. My regular hours are from 8.30 in the morning till 5 p.m. Q. Who has the power of acting during your absence? A. Mr. Papineau acts in my absence. When the orders are given and the work is progressing, Mr. Bridges or Mr. Deans acts in my absence. Q. Do you supervise or arrange for the buying of steel, wood, engines, boilers, winches, pumps, deck auxiliaries and outfit for hull and machinery? A. Yes. I send my list to Mr. Papineau and he makes arrangements with Mr. Doutre at Ottawa. Sometimes he makes changes in the quantities if he believes too much or not enough is ordered. We do not always get what we order. Q. Do you have vessels tried on a measured mile for speed, for coal consumption and performances generally? A. Yes, we have made trials of the *Vercheres* and the *Leamington*, the *No. 21*, and the *Maisonneuve*, on a measured mile. Q. Do you personally supervise the tests? A. Yes, with the assistance of Mr. Bridges and Mr. Deans. Q. Do you work piece work on any parts of the construction of vessels? A. No. Q. Is there any instruction from the government against working piece work? A. I do not know of any. Q. Have you any means of knowing how much work men turn out, saw platers, riveters, caulkers, drillers and carpenters caulking? A. No. Q. Is the men's work for the day tallied up at any time as a check of what they are doing? A. I do not know. This is not my business. I have no authority on that subject. Q. Is there any time allowed for punching time-clock? A. Five minutes at noon. Q. Is there any time allowance for men to wash up before knocking off? A. No. Q. Is there any time allowance for men to return tools to store room before knocking off? A. Five minutes at six o'clock. Q. Do you curtail working hours during winter months? A. Yes, one hour, from seven to five instead of seven to six. Q. Do you lay off the out-door men for bad weather? A. No. Q. Is any record kept of time lost through bad weather? A. No. Q. What action do you take when a foreman reports a man for insubordination, bad time keeping and misbehaviour? A. I send the foreman to report to Mr. Papineau. Q. Do the accountant, timekeeper, paymaster and storekeeper get their instructions direct from you? A. No. The department of cost gives them orders for the disposition of the work, that is to issue the job numbers to the different departments. Q. What record of scrap is kept as a check on the ordering of material? A. The orders to the store are to give a new piece for different machine or tools just when men come back with the old parts. When there is some steel ordered for construction this steel is charged to the store and the requisitions charging the part or piece to the job number. Q. How is scrap steel, iron, copper, etc., disposed of? A. I have nothing to do with that. Q. Do you ever take means to find out the weight of scrap steel left in construction of a boat? A. No. Q. How is the record of weight of rivets kept? A. There is no record kept. It is only in the requisition in store. Q. How is the record of service bolts kept? A. The same thing, they are charged to each construction. Q. Are the disused rivets returned to the store and credited to the ship? A. No. They remain in the department for other construction. Q. Are service bolts rescrewed and used again or scrapped? A. Yes, they are rescrewed and used again. Q. Is there any record of tools given to the men kept? A. I do not know of any. There is no standing order to that effect. Q. Is there any record of the tools returned by the men kept? A. Pneumatic tools must be returned every night at the boiler shop in the tool room, but no other tools need be.

The foreman sees about them. Q. Are tools returned to the store periodically for examination? A. Yes. Q. Have you a telephone system in the yard for calling up various departments? A. Yes. Q. Have you any fire brigade system? A. We have no system, but we have a captain. Q. What kind of fire protection have you got? A. We have two hose reels, 13 hydrants and hose in every important building with stand pipe. Q. Have you any arrangements for supervising w. c. and the time the men spend there? A. No. Q. Do you think the present system of clock timekeeping perfect? A. I think it does as good as any I know of. Q. On delivery of castings and forgings, are weights checked by calculation or otherwise before the invoice is passed? A. They are checked on the scale. Q. Do you check steel invoices for plates and angles by calculation for rolling margins before invoice is passed? A. That is by calculation. As for rolling margin, I report to Mr. Papineau and I do not know what action is taken. Q. Is timber all measured up and passed as to size and quality before invoices are passed? A. I think so. Q. What means do you take to insure that goods as supplied are as per sample? A. That is the storekeeper's business. When special orders for construction come under my department I see to them. Q. Do you approve of the present system of purchasing goods in Ottawa? A. It seems to me that this is a slow way to get what we need. That is the only thing I know about it. Q. Can you estimate the cost of repair work? A. Yes, when the work is specified. With general overhauling of machinery, I cannot do that. Q. Do you ever get a list from timekeepers regarding the number of men working on the yard each day or week or month? A. No, I have absolutely nothing to do with the men. Q. Have you more work ahead of you this year than last year? A. No. Q. Do you know what iron work labour is costing per pound on hull construction? A. Yes. Q. Do you think you have a sufficient number of men for work on hand? A. Yes, we have about 150 men too many about the yard. Q. Have you any complaints to make? A. The only complaint I would mention would be about the authority I would like to have over the foremen and the men, and about the political interference. Q. Have you any recommendation to make as to the more efficient working of the yard? A. There is the question of handling the material and the authority of the men under me. Each foreman I may say should have means of keeping strangers out of the shipyard who are causing us great trouble. That is all I have to say. Q. Do you find any difference now from when Mr. Desbarats was here? A. It is no better nor worse. We have the same difficulty with political patronage. Q. Were those 50 painters fired for political reasons? A. I cannot say, because I had nothing to do with the matter. When I see men in the shipyard I do not know whether they are working for us or not.

MR. D. CHAMPAGNE (PAYMASTER).

Q. What is your name? A. D. Champagne. Q. How long have you been working in the yard? A. 28 years. Q. How long have you had charge of your department? A. 8 years. Q. Where were you employed before coming to the yard? A. I have always worked in the yard. Q. What kind of work were you doing there? A. I was assistant timekeeper and assistant storekeeper previous to my present position. Q. What is your age? A. 43 years. Q. What authority have you regarding employing and discharging men in your department? A. I have no authority. Q. Are the men in your department permanent employees? A. I have only one man and he has only been with me a short time. I had to get a new man on account of the extra work due to paying the men with cheques instead of cash. Q. How do you get a new man when you need one? A. I have to go to Mr. Papineau. Q. Who do you get your instructions from? A. I refer to Mr. Papineau in reference to the yard paying. I also pay the men on the ship channel fleet and this is under Mr. Forneret. I go out once a month and pay the fleet in the summer time, this takes from two to three days as I have to go from Montreal to Crane Island. Q. Who takes your place when you

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are absent? A. Nobody takes my place and nobody has authority to sign pay cheques except myself. Q. Do you sign the book? A. No. Q. Have you any interference from other departments or officials with what you consider the proper running of your department? A. No. Q. Have you any changes to suggest in the running of your department by which you can get better work of your men without additional expense to the government? A. None. Q. What are your duties and responsibilities? A. I have to pay all the men in the yard twice a month. I have to pay all the men on the fleet which is about 900 men and amounts to about \$60,000 per month, once a month in cash. I pay the yard in about half a day while it takes me about three days to pay the fleet. The men on the fleet have to sign the pay roll in my presence and the captain of the boat. Men who can't write make a mark and then I sign the pay roll, the captain signing as witness. I have to check all the pay rolls each pay. I go to the bank and check over the returns with the bank after each pay. The pay for the yard and fleet is deposited in the bank in my name and I have to account for the full amount. I make out reports regarding this to Mr. Papineau. Q. How many men have you under you? A. One. Q. How do you pay the men? A. I pay the yard by cheque for each man. I go to the office in each department and the men come there for their pay. I pay about 100 men in 15 minutes. Q. Are you responsible for the correctness of the pay-roll? A. Yes, regarding the amount of each cheque. Q. How long does it take you to pay all the men? A. Four hours. Q. Do you go around to each department to pay the men? A. Yes. Q. How do you do in the case of overpay or under pay? A. Sometimes it stands till next pay and sometimes Mr. Papineau issues a cheque in case of underpay. Q. Do you pay the office staff? A. Yes. Q. How are they paid? A. I get cheques from Ottawa once a month. Q. Do you issue any cheques for invoices? A. No. Q. Have you any petty cash account? A. No.

MR. PAPINEAU (DIRECTOR).

Q. How long have you been employed in Sorel Yard? A. Since February, 1908. Q. How long have you been Director? A. I have been Director for 2 years, next May. Q. What was your previous employment? A. I was a civil engineer with the Department of Public Works, and before that with the Department of Railways and Canals. Q. What are you professionally? A. A civil engineer and land surveyor. Q. Do you take direct charge of the drawing office staff, approve dimensions of vessels building, fix sizes of engines, boilers and auxiliaries, supervise the designs as to the form of lines, details of construction, stability, carrying capacity, scantlings, etc.? A. No. I look after the general direction of the shipyard, finding about the needs and requirements of the works. I look to the employees, hiring them and discharging them, and supervising generally. The technical part I am not supposed to look after in all details. I have a general knowledge of what is being done. The draughting office prepares the technical work. If mistakes were made in the draughting office, it would naturally follow that the whole of the work would feel the result of such mistakes. Q. Do you engage heads of departments, foremen and workmen, and discharge them personally? A. Heads of departments as a rule are engaged upon the recommendation and approval of Ottawa. As it happens, since I have been here, lately one foreman gave his resignation and another one was dismissed both were appointed by Ottawa, and in that case I had nothing to say in the matter. Dismissals come from the deputy minister in Ottawa. The reasons for dismissals are not given. Q. Do you personally supervise the construction of hulls, machinery auxiliaries, etc.? A. No, not personally. Sometimes I go around the sheds during construction, in the machine shops, etc. Q. Do you supervise the launching of vessels, hauling boats on slips, etc.? A. I authorize the work of hauling or launching vessels. I am asked about this being done and I authorize it. Q. What is the heaviest boat you can slip? A. I think we can dock about 1,000 tons or a little over. That 'No. 10' we built on the slip was about that.

The upper part is a little flimsy, still we had no trouble about it. Q. Do you take stock annually? A. No, not annually. Q. Have you at any time made valuation of the yard, appliances, tools, buildings, etc.? A. I think we had a kind of rough estimate. I have not done it myself. Q. Do you make an annual report of work done, work on hand and money spent for Ottawa? A. Yes. Q. Do you ever compare the amount of work done with the expenditure of the yard, to find out if the work has been carried on economically? A. Yes, when the construction is finished. We inquire from the cost department to find out what is charged and how much money we have. We want to see how we are getting along. For instance, that small tug we are getting repaired now, we know how much everything will cost. Q. Do you make up the cost of proposed new vessels beforehand? A. It has been done this way, that we compare with former prices for vessels of the same kind and what the cost was to build them, and we base on this an estimate of what we should ask. Q. Do you keep proper track of the cost at various periods during construction, so as to be able to pick up any leakage? A. The cost department looks after the expenditure and we ought to be able from the cost to find out what any job has cost, and by that we see whether it is costing too little. There has been a drawback to the cost system in this way, that the indirect cost has to be figured and added to the expenditure. Now it takes at least five weeks before the indirect cost of one month is figured, after the month is run out. They have to bring in all the accounts, bring the distribution of time, and then charge each shop with its share, and then bring that together again to find what the indirect cost as compared to the whole of the work is. Then find out what the labour has been for the job, and apply the indirect cost for each month according to the month in which it has been made. Before that calculation is finished, it is almost 5 weeks after the month is finished. In that way we would want the cost to be ready at the end of the week to give us a result. For that we would have to establish for each month for past years what the indirect cost is, say January, February or March—whatever work was done in one of these months would be charged indirect, at the rate established beforehand at the end of four weeks, and if \$400, say, has been spent on a job, add 30 or 40 per cent, and find that the job has cost us \$520 or thereabouts. Q. On completion of a vessel do you compare the actual cost with the estimate and the time taken to build? A. We do it between ourselves, not in a formal manner. When a vessel should be finished in May, for instance, and it is finished only in September, we know we are behind. Q. What are your daily duties? A. I have to answer any correspondence from Ottawa with regard to work. I have to supervise requisitions, approve or disapprove them and check the quantities that we are asked to purchase. One of my duties is to answer application for work. I do that myself. Men come with letters from deputies and they would feel aggrieved if proper consideration was not given them. This has been a great weight on my office. Q. What are your hours of attendance at the yard? A. I have no fixed hours. I am here as a rule from 9 till 5 p.m. Q. Who has power of acting in your absence? A. The assistant director for most things. The checker acts for certain things. He looks after the discipline of watchmen, time-clocks, etc. Q. Do you supervise or arrange for the buying of steel, wood, engines, boilers, winches, pumps, deck auxiliaries and outfit for hull and machinery? A. We arrange in this way, that for the steel wanted we get a list of materials prepared in the draughting room of the technical department. As to machines, a list is supplied of what will go on a vessel. For the machinery, for instance, we decided together with the foreman or the assistant director what should be purchased; we do the choosing. The requisitions are made and sent to Ottawa. There they either approve of buying the machinery or disapprove. If they approve of buying, they ask for prices, generally on our specification. When they have the prices, they place the order or sometimes ask for tenders. When there is a question as to price of machinery, and the suitability of same, these things are referred to us. In that case we report on what is best suitable. Q. Do you buy timber, logs, etc., here? A. This is

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done in Ottawa. Formerly it was all done here until 1908, when they introduced a purchasing department in Ottawa. From that time they do the purchasing there except for small things. We buy few logs here. Q. Do you have vessels tried on a measured mile for speed, for coal consumption and performance generally? A. We generally make a trial to find the speed of a vessel. We have a measured mile here. As a rule we have not much time to make the trials, for there is always a hurry to get the boats away. Q. Do you personally supervise the test? A. Yes, I have done so with the *Montmagny*. Q. Do you work piece work on any parts of the construction of vessels? A. No, we do not. Q. Is there any instruction from Government against working piece work? A. Not that I know of. Q. Have you any means of knowing how much work men turn out, say platers, rivetters, caulkers, drillers and carpenters-caulking? A. The only way would be by looking over the time charged to each job number. The men are not supervised during the day by anybody. Each foreman is supposed to see that each man does proper duty. We have a man who goes around and reports to the chief of construction, what the gangs are doing, and it was the intention to have him report in detail, but this is not in full swing yet. Q. Is the men's work for the day tallied up at any time as a check of what they are doing? A. Each day the time is charged to the different jobs. Q. What supervision have you over all the various repair jobs now going on? A. It is the return of the job numbers and the information from the foreman occasionally about his getting on with repairs to such boiler, or putting together an engine, etc., which supply us in that case. I do not go personally now and then to supervise the works. Q. Is there any time allowed for punching time-clocks? A. There is an allowance of 5 minutes before 12 at noon, to give the men a full hour for dinner. The whistle blows at 5 minutes to 12. This allows the men 5 minutes to punch their time and have an hour. Q. Is there any time allowance for men to wash up before knocking off? A. No, there is no time allowance. Q. Is there any time allowance for men to return to store room before knocking off? A. Yes, they get about 10 minutes to get their tools in. We do not object to their taking that time. They have heavy tools, such as a pick, for instance, pneumatic tools. Q. Do you curtail working hours in the winter months? A. Yes, it is 9 hours instead of 10 hours from November till March. Q. Do you lay off the outdoor men for bad weather? A. No. Q. Is any record kept of time lost through bad weather? A. No. Q. What action do you take when a foreman reports a man for insubordination, bad timekeeping and misbehaviour? A. I suspend him. In some cases the man is dismissed. When the men have actually been dismissed I do not think I will get them back. Q. What authority do you give your assistant for dealing with matters pertaining to the working of the yard generally? A. He has authority to distribute the work and, to a certain extent, determine what particular should be begun and tell the men, when ready, to go on with such a work. He has a great deal of authority on the foremen, who consult him on all technical points. Q. Does your assistant have a free hand? A. Oh yes, as regards the employing and discharging of men. In case of insubordination he could suspend a man, but he would report to me. He can suspend but not discharge a man. Q. Do the accountant, time-keeper, paymaster and storekeeper get their instructions direct from you? A. Yes. The accountant to a certain extent reports to Ottawa through me. In some cases they act direct. Q. What record of scrap is kept as a check on the ordering of material? A. There is no record daily kept of that. Q. How is scrap steel, iron, copper, etc., disposed of? A. It is sold upon offers made to the department at Ottawa. We send a list of what we have and they ask for prices. This is done about once a year. There is no regular date for this sale. Q. Do you ever take means to find out the weight of scrap steel left in construction of a boat? A. No, we do not. Q. How is the record of weight of rivets kept? A. The rivets are called for upon requisitions, and charged to the job. They are taken away in small quantities. What is not used ought to be returned, but I cannot say positively that they are. Q. How is the record

of service bolts kept? A. In the same way as they are charged. They ought to be credited when the construction is finished, and charged to the next construction with a discount. Q. Are service bolts rescrewed and used again or scrapped? A. Yes, when they are thrown away they are rescrewed and used again. When they are not spoiled they are used until they are unfit. They are passed through the screwing machine and used again. Q. Is any record of tools given to the men kept? A. They are checked off the list. If a man should not return the tool he is asked for it, but no record is kept. Q. Are tools returned to the store periodically for examination? A. Yes. We have a department in the machine shop that looks after any tool that has become blunt, and it is run through the machine shop. No tools are sent to the store except in case the men are short of a new tool, when they will borrow from the store and return it there when through with it. The tools are always used until quite finished. Q. Have you a telephone system in yard for calling up various departments? A. Yes. Q. Have you any fire brigade system? A. We have no organization. The foreman of the pipe shop has to look after that and his men are supposed to form into a brigade and help. We try the hose, but not in winter time as it would become frozen but in summer time. Q. What kind of fire protection have you got? A. This consists in a few Babcock extinguishers in the buildings, and we have two hydraulic pumps driven by motor, and a spare pump which can be driven by steam. Q. Have you any arrangement for supervising w.e.'s, and the time men spend there? A. No, we have no regular system. Q. Do you think the present clock system of time-keeping perfect? A. Well, I do not think it could be called perfect. There is a great inconvenience. The clocks seem to be affected by the weather in winter time. We find them getting out of order, the one outside. Sometimes the figures that show the time seem to have stopped, probably because the clock is stopped and remains slow or behind time. They will show, say 5 when they should show 7, etc. Q. On delivery of castings and forgings, are weights checked by calculation or otherwise before the invoice is passed? A. No. They are compared with the drawings and if they suit, very well. Q. Do you check steel invoices for plates and angles by calculation for rolling margin before invoice is passed? A. Sometimes we do, but not in every case. Sometimes we compare the weight of the forgings with the invoice, but not always. For overweight we do not deduct anything. The invoices are checked; we run the list through to the office. The contracts for steel are made in Ottawa, but I do not think there is a clause as regards the rolling margin. Q. Is timber all measured up and passed as to size and quality before invoices are passed? A. Yes. We buy the round logs. We pay for these at the rate that we pay for a log equal to the square. We take the full diameter and deduct a quarter from it. We take the middle diameter and deduct a quarter. For instance, a 16-inch diameter will give a square log of 12 inches, and we do not pay for the slab. Q. What means do you take to ensure that goods as supplied are as per sample? A. We do not always have samples. For cotton waste we get samples and compare. For oakum we get samples. Our checker makes the comparison with all the samples we get. If the checker has doubts about values we ask a competent foreman to compare with what we have had before to see whether it is the right thing. We send samples to Ottawa which are not returned. Generally we have a lot of the old stock to compare with.

They send us a sample from Ottawa and leave it here as a standard, for instance, when they buy brooms, they send us one for a sample. When no sample is sent from Ottawa, we find out by comparing with what has been sold to us before. When we find the goods inferior, we advise Ottawa and they make a claim upon the company selling the goods.

Paint is always bought at Ottawa. I think they buy on samples. They do not always send us samples of white lead. Lately we got some yellow paint and it must have been inferior, because when using it we used three times as much oil to make it useful. We reported to Ottawa. They insist on pure paint when it is not pure paint.

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Q. Do you approve of the present system of purchasing goods in Ottawa? A. I have no objection to that system. For certain things it is all right. For other things it is a little slow. Oils, paints, bolts, nails, etc., are things which they can buy easily and probably a little cheaper by buying for the whole Dominion. They get better prices from the manufacturers who find it worth their while to give low prices for good customers. Q. Can you estimate the cost of repair work? A. I would not venture out in that direction. Q. Do you ever get a list from the timekeeper regarding the number of men working in the yard each day or week or month? A. I know by the lists every evening. I would know if their number was increasing because I know of all men coming in to be appointed. As the works get on towards construction we attend to dispensing with men. When work is getting scarce the foremen will tell me, 'We have too many men and will want less in a few days.' 80 or 90 men, boiler-makers, will be dismissed shortly because new work is not plentiful. In March we stop the work of painters every fortnight because work is scarce then. Q. Have you more work ahead of you this year than last year? A. This year we have less. Q. Do you know what iron-work labour is costing per pound on hull construction? A. No, we have no figures on that. Q. Do you think you have a sufficient number of men for work on hand? A. At present, we have fully enough. Q. Do you think you have too many men for work on hand? A. Not just at present, but in another 3 weeks we will have too many. We are paying off 80 or 90 just now. Q. If so, about how many? A. We have about 950 men now, and at the end of April we should get them down to 750, which would mean that we have about 200 too many, although I do not say that we have 200 too many now. Q. Have you any complaints to make? A. The worst thing is the pressure from outside to force men into employment against our present needs. If a man goes, for instance, 6 hours before I know there are 2, 3, 4 or 5 men offered to take the place. Q. Do you take upon yourself to discharge the men? A. This could be placed in the hands of one of the officers. At one time it was decided that the time-checker should look after that part. Q. Would it not be better if each foreman would employ his own men? A. There might be drawbacks to that. The foreman is the best judge of the worth of the men at work, because he has them under his eyes. At the same time, the men are related or friends of so and so, and whenever there is a job, well paid, the foremen are subjected to that outside pressure. Even now, this is tried. The foremen are asked to look after such and such an employee, to get him a good job and good pay, and to even get others out to make way for that man. Q. Do you fix the men's rate of pay? A. Yes. We had a kind of schedule of prices arranged from such a price to such a price, and as the men came, unless they are known to be very good men, we start them at the lower price and work them up to a higher rate as they become more competent for our work. A young man comes in as an apprentice, say at 50 cents a day, the starting price, and works up until he earns \$1.25 a day, and up again until he is put at the rate paid a regular mechanic. There are few apprentices here in the machine shop, for as soon as they know the trade a little they go. They are supposed to serve three years. Q. Do you bind the apprentices to a certain number of years? A. A boy comes here and is supposed to serve 5 years. That boy is to be paid so much money and raised each year, but he must serve 5 years. These men in the machine shop are somewhat under these lines. They began at 50 cents and worked up. After that we give them good wages. We have formed some pretty good men. Q. Have you any recommendation to make as to the more efficient working of the yard? A. I think we would get better results if we could give better wages and cut down the number of men employed to that absolutely required in each shop. We would get a better class of people. There are a good many men who have left Sorel and gone elsewhere, who would be quite willing to come back if they could get good pay. The men who are willing to stay here are not the best of each kind. I may be mistaken though. The deputies recommend men rather recklessly, and they have a way of

imposing such men much against my authority and against the authority of the foreman. Q. Do you sometimes get an inferior man because of political backing? A. Well, sometimes we feel we have men we would not pick out for ourselves, and we are forced to employ them. If we had a free hand we would be better off. The right way would be, for instance, if we wanted two or three good carpenters; the patronage, of course, rests with the deputies; they would be notified of our need of these carpenters; they would pick out, among the best, two or three first-class men and send them to us, not send 20 applications and let us pick out without a chance of getting the right men, the rest of them fighting among themselves and going back to the deputies and reporting that 'we have been there and we cannot get any work.' For instance, in January last my office was filled with about 50 men with letters. It took me over two hours to look over that list and say, 'no room, can't be done.' Sometimes we would take one man, the others would say to their backers, 'they have taken so and so and they would not take me.' This is a loss of time and it is a bother for deputies. They do not get much credit and we do not get any at all. I might be better employed otherwise. If the men come with a letter from the deputy, that letter is addressed to me personally, I have to be very careful, I must read it carefully, give it great consideration, and give the bearers some kind of reason for not taking them on at once. They believe they should start right away. We give them as good an excuse as we can. If we cannot say 'yes' for the present, they will come the next day, the next week, and will return perhaps 10 or 12 times. Some of them do not live far and are always here. It is all a great loss of time and a great bother with no good result. There is also the difficulty about the men living across the river. We have a few who, after punching their time, go across and spend the morning idle and come back in time to punch the clock again. They do that without being seen by the foreman, but some have been caught and have been discharged, and I have never taken them back. However, there is no particular way of closing the yard to prevent that sort of thing. We have to have watchmen all the same with automatic fences.

This concludes Mr. Papineau's evidence and the investigation.

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APPENDIX E.

LIST OF TIME CLOCKS AND LOCATION.

No.	Clock.	Located.	In charge of
1.	1-200.	Machine shop.	Leon Dessert.
2.	401-600.	" "	Agel. Bouchard.
3.	201-400.	Sawmill.	Cuth. Champagne.
4.	601-800.	Shed No. 9 in yard.	Ad. Joubert.
5.	801-1000.	" " "	John Hayden.
6.	1601-1200.	Boiler shop No. 2.	Treille Grondines.
7.	1201-1400.	" " " 1.	Wilf. Davignon.

DISTRIBUTION OF MEN ON CLOCKS.

- No. 1 Pattern makers, blacksmiths, and machinists.
 " 2 Carpenters, saw mill, labourers, painters and asbestos.
 " 3 Carpenters, electricians and labourers.
 " 4 Labourers.
 " 5 Machinists (fleet), boiler makers (fleet), and labourers.
 " 6 Boiler makers.
 " 7 Boiler makers, steam fitters and mould loft.

NOTE.—There are about 150 men on each clock.

APPENDIX F.—Buildings Plan (Not printed.)

APPENDIX G.

CONTRACT FOR ELECTRIC CURRENT.

THIS INDENTURE made in duplicate this first day of October, in the year of our Lord one thousand nine hundred and nine.

BETWEEN the Sorel Electric Company, a body politic and corporate having their chief place of business at the City of Sorel, Province of Quebec, in the Dominion of Canada, represented herein by A. E. Ponthriand, President of the said Company, hereinafter called 'The Company,'

Of the First Part;

And HIS MAJESTY KING EDWARD the SEVENTH, represented herein by the Honourable Louis Philippe Brodeur, His Majesty's Minister of Marine and Fisheries for Canada,

Of the Second Part.

WITNESSETH that in consideration of the covenants and agreements on the part of His Majesty hereinafter mentioned the Company covenant and agree with His Majesty as follows, that is to say:—

1. The said company shall supply to the Government Workshops at Sorel aforesaid, the electric current for the operation of the several machines, appliances and for the lighting at and in the said Government shops and shipyard;
2. The electric current so supplied by the said Company must be such as to produce at any time and at all times as may be required by His said Majesty as aforesaid, four hundred and fifty electrical horse-power, and for the purpose of such measurement seven hundred and forty-six watts will constitute one electrical horse-power.
3. His Majesty to have the privilege of using power in excess of that contracted for up to twelve and one-half horse-power, for which no charge will be made, but should the power consumed exceed the said amount of twelve and one-half horse-power, His Majesty to purchase whatever additional power may be required for his use in units of not less than twenty-five horse-power, at the price hereinafter mentioned.
4. The said power shall be supplied by the said Company at the switchboard where directed by the officer delegated for that purpose by the Minister, in the form of a two phase thirty cycle alternating current of about two thousand two hundred volts;
5. It is also understood and agreed that the Company shall not be in any way responsible for the transmission or control of electric power covered by this Agreement beyond the point of delivery at the primary terminals of the switchboard or transformers of His Majesty at the voltage and frequency called for in clause four (4) of the Agreement;
6. That His Majesty, represented as aforesaid, shall so arrange its use of power furnished under the terms of this contract that the power factor of its load shall not be less than 90 per cent, and for the purpose of determining whether His Majesty is using more power than he is entitled to under the terms of this contract, if the power factor is less than 90 per cent, it shall, for the purpose of such determination be calculated on the basis of 90 per cent power factor;
7. It is understood and agreed that the said Company shall supply the said current during the twenty-four hours of the day;
8. Meters to record the amount of power used will be installed by the said Company, at their own cost, at the said Government workshops, and the said Company shall have right of access to said meters for the purpose of observing the same. Said

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meters shall be calibrated by the said Company at such times as may be deemed necessary: provided always that His Majesty may, at any time, have said meters calibrated by competent persons, by giving at least two days written notice to the said Company of his intention to so calibrate them;

9. It is understood and agreed that the said Company shall take all possible care to prevent any interruption in the delivery of the current hereby contracted for, it being understood that should any interruption occurring through any cause beyond the control of the said Company, such interruption shall not vitiate the present agreement, but if the interruption of power should last for two hours or more, there will be a proportional rebate in the rental hereinafter determined. No account will be taken of interruption of power for a period or periods of less than two hours.

10. The present indenture shall remain in existence during a period of five years to date from the first day of October, one thousand nine hundred and nine, and may be renewed at the option of the party of the second part for a further period of five years by giving notice in writing six months previous to the expiration of the contract to the said Company to that effect, always under the same terms and conditions as herein stipulated.

11. Should the said Company fail to carry out all the provisions and stipulations of the present Agreement to the satisfaction of His said Majesty, it shall be lawful for His said Majesty to cancel the same by giving a three months' written notice to that effect; and in case of such cancellation, the said Company shall have the right to be paid a proportion of the contract price hereby provided for up to the date of such cancellation and no more; being expressly understood and agreed that the said Company shall have no right to claim any damage from His said Majesty on account of such cancellation;

12. And for the proper and efficient carrying out of the several provisions and stipulations of the present Agreement by the said Company, His said Majesty shall pay the said Company at the rate of Thirty Six Dollars and Fifty Cents per annum per electrical horse-power for four hundred and fifty horse-power, being a yearly sum of Sixteen thousand four hundred and twenty-five dollars in lawful money of Canada, payable in monthly payments of Thirteen hundred and sixty-eight dollars and seventy-five cents, to be reckoned from the said first day of October, in the year one thousand nine hundred and nine.

13. Should any difficulty or difference of opinion arise as to the interpretation or proper carrying out of the present Agreement, the decision of His said Majesty represented as aforesaid, shall be final and conclusive;

14. In this Agreement and wherever the Company is mentioned, it shall be taken and construed as binding on themselves their successors and assigns; and whenever and wherever His Majesty is referred to, it shall be taken and construed as binding on His Majesty, His Heirs and Successors as represented by the Minister of Marine and Fisheries for the time being.

IN WITNESS WHEREOF, the parties hereto of the First and Second parts have hereunto set their respective hands and seals the day, month and year first above written.

Signed, sealed and delivered by
the Company in the presence
of:

Signed, sealed and delivered by
the Minister of Marine and
Fisheries in the presence of: