

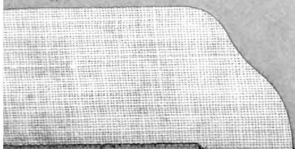
AGENT'S ANNUAL REPORTS AND  
STATISTICS  
YEAR 1900.

MS 86-100  
2066

ANNUAL REPORTS AND STATISTICS  
DEPARTMENT OPERATIONS  
YEAR ENDING NOV. 30, 1900

I N D E X

1	Master Mechanic's Report <i>cef</i>	1	✓
2	Vessel Department Operating Statistics Cleveland-Cliffs Iron Company	2	✓
3	Railroad Department Manager's Annual Report Lake Superior & Ishpeming Ry. Co.	3	✓
4	Annual Report of Lake Superior & Ishpeming Railway Company to Commissioner of Railroads	4	✓



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\*\* THE CLEVELAND-CLIFFS IRON CO. \*\*  
\*\* ISHPEMING, MICH. \*\*  
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\*\* MASTER MECHANIC'S REPORT. \*\*  
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\*\* NOVEMBER 30th, 1900. \*\*  
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CLIFFS SHAFT MINE:

Power Plant.....	1	
Hoisting Engine.....	1	- 2
Pumping Engine.....	2	
Compressors.....	3	- 4
Crusher Plant.....	4	
Auxiliaries.....	4	- 5
Boiler Plant.....	5	

SALISBURY MINE.

Power Plant.....	5	
Hoisting Engine.....	5	
Cornish Pump.....	6	
Air Compressor.....	7	
Boiler Plant.....	7	

LAKE MINE:

Air Compressor.....	8	- 9
Electric Engine.....	9	
Tram System, Electric.....	10	- 11
Mine Pumps.....	12	
Steam Auxiliaries.....	12	- 13
Lake Angeline Drainage.....	13	- 14
Boiler Plant.....	14	- 15

CLEVELAND NO. 3 MINE:..... 15

MORO MINE:

Cornish Pump.....	16	
-------------------	----	--

VOLUNTEER MINE:..... 16

MICHIGAMME MINE:

Hoisting Plant.....	16	- 17
Compressors.....	17	
Crusher.....	17	- 18
Mine Pumps.....	19	
Boiler Plant.....	19	

IMPERIAL MINE:

Mine Pumps.....	20	
Boiler Plant.....	20	

WEBSTER MINE:

Webster Power Plant.....	20	- 21
--------------------------	----	------

GENERAL RECOMMENDATIONS..... 22

THE CLEVELAND)CLIFFS IRON CO.

Mr. M.M. Duncan, Agent,  
Ishpeming, Mich.

Dear Sir:-

I wish to submit the following report on the changes in the Power Equipment of the various mines, that were made during the past year. I submit with this report, a statement showing the amount of work done, fuel consumed, oil used, etc. for each mine separately, and for each month of the year. This summary is taken from the Engineer's Logs which now have been in use for a little over a year.

CLIFFS SHAFT POWER PLANT.

There has been practically no change in the power equipment of this mine, during the year just finished. We have been rather more fortunate during this year in regard to break downs, than I had anticipated from my experience during the year 1899.

HOISTING ENGINE.

On the hoisting engine, which remains as it was last year, we have had but two stopages, one of which was very fortunate as to the time of its occurrence. The first was an accident to the condenser, by which it was necessary to lay up the condenser for about a week, during which time the engine was run non-condensing. This accident caused a delay of only about three hours. The other accident was caused by the breaking of the crank pin at 5 O'clock in the morning of July 18th, but as the mine was to be closed at six on account of it being circus day, thereby giving us twenty-four hours to make repairs, there was but one hour delay through this accident.

There have been a few minor accidents, one caused by the hoisting cable breaking on the "B" Shaft, while there have been some cases of over-winding by the brakemen, and a few cases of the cage being lowered on to the catches too hard. In other respects we have been very fortunate.

## HOISTING ENGINE (CONTINUED).

The broken gears of the hoisting plant are still running, as they were last year. In spite of the record this engine has made during the year just finished, I do not feel that it is at all reliable, and it is certainly very far from economical.

### PUMPING ENGINE.

The pumping engine and the attached apparatus, has not given as much trouble the year past, as it did during the year before, but I believe this is due largely to the fact that the iron work on these rods has been replaced as it broke down by new and heavier material.

During July, we broke a tooth from the main pumping gear; this was repaired with pins, and has since been running with little trouble. In June, through the carelessness of a new Engineer, the engine got a large amount of water in the steam cylinder in starting, which cracked the cross head; we at once ordered a new casting, and patched the old one to run temporarily, the patch proving so effective, that the old cross head is still in service. This pump is still considerably out of balance, the "A" Shaft rods being very much in need of increased balance weights. I believe it would be advisable to place a hydraulic balance on this pump similar to the one which will very shortly be installed at the Moro Mine.

From the Cliffs Shaft Logs, it will be noticed that the amount of water pumped, became gradually less from December until April. We had comparatively little snow on the ground last winter, it gradually went away the first week in April. From that time on, the amount of water handled, varied to some extent with the amount of precipitation, until the last three months of the year, it has been gradually ~~XXXX~~ growing larger, apparently regardless of the rain fall, which fact, I presume is caused by the sinking now being done in both shafts. The following is a table of precipitation, as shown by the Government Report for the city of Ishpeming, Mich. during the past year.

Precipitation for year November 30th, 1899 to November 30th 1900,  
by months.

December	1899	3.19"
January	1900	.85"
February	"	2.35
March	"	1.75"
April	"	3.15"
May	"	2.54"
June	"	2.43"
July	"	7.15"
August	"	3.32"
September	"	10.60"
October	"	2.68"
November	"	<u>.65"</u>
Total		40.66"

(September 11th, we had 2.7" from 10 P.M. to 4 P.M. during 18 hrs.)

In this table, melted snow is figured as inches of rain fall. It will be noticed that the rain fall has very little effect on the amount of water made by the Cliffs Shaft Mine.

#### COMPRESSORS.

These compressors have been working throughout the year with comparatively little trouble, except the fitting of one new crank pin and the breaking of the piston in the No. 4 Air Cylinder. They were run at an average air pressure of 67# until the beginning of October, when the safety valve was set at 80#, and the running pressure raised to about 75#.

I believe, from what observations I have been able to make, that we break more ore with a given amount of free air, when compressed to 75# pressure, than with the same amount of air, with 65# pressure. As we have had only two months for observing, namely October and November, we have not proven anything as yet. It must be borne in mind, however, that during these months we have been sinking the shaft and have been working the hoist and steam pump with air. These compressors make on an average



<sup>now</sup> Now, of about 35 millions feet of free air per month. These machines are very far from economical, and are somewhat more uneconomical with 75# Air pressure than with 65#. They should have been discarded several years ago.

#### CLIFFS SHAFT CRUSHER PLANT.

The crusher plant is running just as it was last year. We have returned to the use of chilled cast iron face plates, with manganese steel side liners. I may add that the first liner which was put in use, one year ago in September, is still in service, and from all appearances will almost complete the year 1901. From my experience with the Michigamme Crusher Plant, it has led me to believe that we could reduce the cost of crushing and top tramming at this mine to about 1/3 its present cost, by reorganizing the present crusher plant and tram system. There would also be a saving of about \$1800 per year, by being able to dispense with a large amount of sledging and block holeing underground, which could be done by using crushers, large enough to take in the large pieces of ore, without having to undergo the sledging process. The crushers we have in service here are only, 24" X 24", while the crusher we have at the Michigamme Mine is 30" X 30", so that there would necessarily be a large amount of ore, larger than 24" X 24", but smaller than 30" X 30", which has to be broken up with sledges.

The present crushers, owing to their construction, are also very expensive in labor of operation, in oils and in repairs. These present crushers have about all they can take care of, when breaking the entire product of this mine down to 2½".

#### CLIFFS SHAFT AUXILIARIES.

The auxiliaries at this mine are the same in size and number as last year. Up to the present time, however, the heating at this mine has always been done with live steam, in the dry, new office building, old laboratory, and a part of the heating in the other buildings.

We are at present installing, and will soon have in operation, the Wester Vacuum System of steam heating, by which we will use the exhaust from the #1 compressor, which will be more than ample for all the

heating. We expect to carry from two to three pounds back pressure, and when this compressor is not running, which is only about two hours per day, and from Saturday night until Monday morning, we will have to use live steam. We expect to save at least 30 tons of coal per month, by this method of heating, while it will impose but little additional load on the compressor.

The feed water heater, which supplies hot water to the boilers at this mine is rather too small, as the temperature is only 185° to 195°, while we should get from 208° to 210°. I believe the change in the heating system will help this out to some extent.

#### CLIFFS SHAFT BOILER PLANT.

The boilers are running under identically the same conditions as last year, and we are using the same grades of fuel. We have had during the year considerable repairs on the #7 and #8. These two boilers are much older than any of the others, and are apparently becoming frail. These two, however, are almost continuously in service, except for their regular cleaning.

We have had no repairs on the other boilers during the year, and are still allowed the same pressure by the Hartford Inspector, as we were permitted to carry last year, namely 80#.

#### SALISBURY MINE POWER PLANT.

This plant is running identically as last year.

#### HOISTING ENGINE.

The engine handling the skip, is much too small for the work it has to do, and I would earnestly advise, that in case it is decided to do nothing in relation to the new equipment, through steam or electricity, that the present 18" X 48" Cylinder be replaced by a 22" X 48". By this change, I believe the engine will run much steadier, and will certainly give us very much better economy.

The engine running the trolley is running very satisfactorily. It handles the men, timber and supplies. There is very little work re-

quired of it, as it only makes about from 40 to 45 hoists per day.

### CORNISH PUMP.

The cornish pumping engine has been running throughout the year, with very little trouble. We have had very little difficulty from having to run this pump at an excessive speed, as we frequently had to do last year. This was caused by a large amount of water going into the mine through the various caves from the large drainage area above this mine. Last spring we provided an emergency pumping plant to take the water from above the mine and elevate it about 30', passing it over a low place in the range of hills just south of this mine. This pumping plant consists of a Diamond Drill boiler, and large duplex jet condenser pump, formerly used with the Smith Vaile Pump at the Hematite Mine, rigged up as a direct acting duplex steam pump. With this plant we have been able to pump as much as 600 gallons per minute, over the hill, which has greatly reduced the amount of water that would have gone into the mine.

This pumping plant will explain some of the apparent vagaries in the number of gallons of water, pumped from the mine per month. It will be understood that with a steady rain, of say two days duration, when most of the water goes into the ground, this pumping plant would not be run, but the water would nearly all soak into the mine. However, in case of a heavy downpour, when the water would run freely on surface, this plant would be in operation. This explains why, for the month of September with its 10.6" precipitation, which came generally in heavy rains, shows no more water pumped from the mine than for October with 2.68" precipitation.

We have had but two break downs on this pump, both due to breaking the rods and connections, owing to bolts becoming loose; otherwise we have had little or no trouble with this pump.

## AIR COMPRESSOR.

The air compressor at this plant is sadly overworked, as may well be imagined when it is remembered it is only one-half of the duplex 16" X 30" machine, such as we have at the other mines, still it has made as high as 21 million feet of free air per month. It probably never makes less than 13 million feet, and with this as compared with the 30 to 35 million feet handled by four air cylinders at Cliffs Shaft, or by the 12 to 15 millions made by a single machine at #3 Engine House, it may readily be seen that this machine is too small for the work. Of course, the greater part of this air is used for ventilation, but I am not willing to believe that the miners waste the air, or use a greater quantity than they really need.

We are seldom able to raise the pressure to 60#, so that it is hardly possible to do very effective drilling with the low pressure, which we are able to get. We are now sinking this shaft and the compressor runs the small #5 Cameron Pump together with the small hoist. This mine should at any event be provided with a larger compressor.

## BOILER PLANT.

The boiler plant is working under the same conditions as last year, except that we are using a little larger proportion of slack than last year. There has been no trouble with the boilers, but we were unfortunate in having a smoke stack blown down, during a violent storm last February, which caused us a few hours delay. The stack was old and badly decayed, and we at that time had one under order at the boiler makers, which was soon installed.

During the past summer the coal dock was considerably enlarged so that it now holds our winter's supply of fuel, and the dock at the same time was arranged so that the car would run back itself, thereby considerably reducing the labor required for stocking coal.

7

## CLEVELAND LAKE MINE.

There have been but few changes made in the equipment of this mine during the past year. The hoisting engine has run throughout the year without accidents to the machine itself, and with very little cost for maintenance or repairs. Last February, we removed the first hoisting rope, this engine ever used, which was installed in August 1892 and which hoisted every pound of ore brought from this mine, since the plant was installed until that time. The rope which replaced it, will not last nearly so long.

We have had two accidents to the skip at this mine, caused by dirt freezing in the dump holding the skip temporarily until some rope was paid out, and before the slack could be taken up, the skip would fall breaking the rope. There seems no way to prevent this, with the kind of dump in use, except to depend upon the watchfulness of the men to prevent the dirt from accumulating.

We are now installing a top tram system which we trust will be able to take the ore away from the shaft almost as fast as it is desired to bring it up. It must be borne in mind, however, that the extreme length of this tram, from one end to the other is 2000', so that when the stock pile ground is pretty well filled, it will be necessary for the tram cars to make the round trip of 4000' every two minutes, if there is to be no delay in hoisting.

The greatest rate, of which we have knowledge, at which we have hoisted ore at this mine has been 29 skips in 27 minutes. At this rate it would be necessary to run a tram car at a speed of 22  $\frac{3}{4}$  miles per hour continuously, exclusive of stops, in order to take the ore away. Including the stop for loading and reversing the car, the speed would probably have to be nearly 30 miles per hour. It is readily seen that this is impossible, but we hope to maintain a speed that will cause very little delay to the hoisting. It will not require so much labor for its operation.

## AIR COMPRESSOR.

We are still using the 16" & 16 $\frac{1}{2}$ " X 30" Rand Duplex Compressor, which formerly came from #3 engine house. This compressor is very unecconomical in the use of steam, and is not anything like large enough for the work it has to do. We are very rarely able to get 60# air pressure, and it

is frequently run at its maximum speed, for hours at a time, with the air pressure not above 45#.

This machine has had considerable repairs during the year, having had two new crank pins, a set of keys in the fly wheel, new main bearing brasses, new valve stems, one new air cylinder head, and almost all of the other air valves <sup>have</sup> been replaced.

There is considerable drifting in rock and hard ground being done at this mine, and with the pressure we are able to maintain, a drill is almost useless. How we are to provide additional power for sinking a new shaft, and driving the connecting drifts, I cannot say. I hope ~~immed-~~  
~~iate~~ steps will be taken in relation to our power very shortly, in order that something may be done towards giving this mine increased compressor capacity.

This compressor now makes regularly, from 30 to 35 million Cu. Ft. of air per month, and even then is not able to supply anything like the quantity required. The greater part of the air used at this mine, is blown away in the stopes, for ventillation, and it is impossible for the men to work in the majority of them without this ventillation. As the mine becomes deeper, this demand will, in all probability be larger, and it appears to me, that the demand for a machine of greater capacity and greater economy is very urgent.

A very large proportion of the fuel used at this mine, is used by the compressor, and a modern compressor should supply this air with a consumption of only about 2/5 the fuel required by this uneconomical machine.

#### ELECTRIC ENGINE.

This 16" X 42" Allis Corliss engine, originally in use at the Hematite Mine, was built for about 80# steam pressure. We are giving it all the work it can do with 120#, so that it appears that the machine is working beyond an economical rate, and from the high steam pressure, the strains on the engine are excessive.

The style of frame was not adapted to the high rotative speed and the high pressures at which the engine is working, and the amount of work required of it has become so great, that it is hardly safe. We have

had no delays during the past year on this machine, but there have been considerable repairs made on cross heads, connecting rods, brasses and pins.

#### ELECTRIC TRAM SYSTEM.

We have added during the year, one Westinghouse mining locomotive in addition to the four originally in use. There are now four locomotives on the second level, with three continuously in use, while one, the #4 motor (Jeffret Manufacture) has been transferred to the 3rd level. The cars, tracks and equipment on the second level, as well as some of our motors, are getting old and there is necessarily greater maintenance expense under such conditions.

The motor tram cars originally installed in this mine, were about as bad, from a mechanical stand point, as it would be possible to conceive. The frames were very rigid, there being no elasticity in them whatever, excepting when the rivets became loose; the wheels were small in diameter being only 12", running on 3" axles, so that friction from that cause alone, was necessarily great at high speeds, while the wheels were so arranged, that it was impossible to keep the dirt out of the bearings, and it is not infrequent that a car comes down to the shaft with two wheels sliding.

The tracks and cars are in such condition, that recent tests have shown as high tractive power required for trains of four loaded cars, as was originally required for ten loaded cars, when the tracks and cars were new. In addition, no reduction in load had been made on the motors to allow for this heavy pull, until within the last few months, the result being, large repairs required for motors, and frequent burning out of armatures, due to excessive heating and roasting from the heavy over loads.

We have recently received the installment of ten cars of different design, which promise a great reduction in the tractive power required, and since they have spring trucks, will undoubtedly be much easier on the tracks and switches. They are side dumping cars, with the doors opening on the side so that any spilling of dirt along the track, will be at the sides instead of being dropped along the middle, as was the case with the old cars, which had bottom doors and spilled a great deal of dirt on the track.

Some of these new cars were recently, and from the preliminary

tests made, show considerably less power than the old ones. I am fully convinced that it would pay us to equip the mine throughout with these new cars, as I believe their cost would be saved in the cleaning of tracks and repairing of cars, in less than a year and one-half.

The rapidity at which things move in this mine when hoisting uninterruptedly, is surprising. The car mileage during the past year has been 113,972, while actually hauling ore, rock, mud and timber. Switching and extra work would probably increase this 5%, while the locomotive mileage has probably been not less than thirty thousand. These figures have been obtained from the reports of ore, rock, mud and timber handled, and on file at the office at the mine, multiplied by the known distance that a car has to travel in making a round trip to the part of the mine from which the material has been handled.

The above mileage may give some idea of the work actually done by these cars. They have handled 155,225 cars of ore, 7589 cars of rock to the shaft, 5041 cars of rock that have been put away in the mine, 492 cars of mud, and 4374 cars of timber, a total of 172,721 cars.



## MINE PUMPS.

The pumping during the past year has been done almost entirely by the 12 & 20 & 6 X 12 Duplex Deane Pump on the 3rd level. There is a #7 Knowles at the bottom of the shaft, a #6 Knowles on the 3rd level in #3 shaft, while two #10's are still installed at the 3rd level for emergency work.

We did not have the revolution counter on this pump until Oct. The amount of water handled from the mine, in ordinary conditions of weather is comparatively small, being an average of 138.9 gal. per minute for November. During the Spring and summer, when we have considerable rainfall, this quantity will undoubtedly be considerably increased. This amount of water is surprisingly small for a mine situated under an old lake bottom, and with so many caves on surface.

In view of the fact that we will soon abandon the #3 shaft, with its separate steam driven hoist, we will then have use for steam in the mine only, to handle this small amount of water. As the lift is 400', to handle 200 gallons per minute with an electrically driven pump, would require only about 12 H.P. I believe it would prove highly profitable, since we have electric power passing through the pump room, to install a small electrically driven pump, as we would then be able to dispense with the use of steam in the mine entirely. Our present electric engine could take care of this slight increase in load without difficulty. The present pump and piping should be left as they now are for emergency work.

In view of the fact that we will undoubtedly maintain the electric tram system at this mine, until the ore is all taken out, I believe it would prove very satisfactory to install an electric pump, whether we should ultimately install electric power throughout or not.

## STEAM AUXILIARIES.

We still use the steam driven hoist, hoisting ore from the 3rd level South deposit, to the 2nd level. This engine has 1135' of 4" pipe running from the shaft <sup>to</sup> of its location, and the condensation from this pipe alone is undoubtedly several times the amount of steam used by the pair of 12" X 16" engines on the hoist. However, we will soon dispense with this hoist, as a drift is being run on the 3rd level to connect the

South deposit, when the ore will be trammed out by the electric pump, on the 3rd level instead of on the 2nd as at present.

There is also a 7" X 10" Duplex engine in the shaft house, which handles the top tram cars to and from the pocket. We are installing a pair of 13" X 12" engines, for operating the stock pile tram system.

There is also a 6" X 12" engine in the shaft house, for driving the sampling crusher. These are all the engines using steam, outside of the main engine house and mine.

In the main engine house there is a 9" X 12" engine driving the fans for producing draft for the stokers. There is also a 14" X 18" steam cylinder on each stoker; a small Duplex Knowles pump  $5\frac{1}{4}$ - $3\frac{1}{2}$  X 5" for operating the brake on the hoisting engine. There is also a Deane Condenser maintaining a vacuum for the hoisting engine. A #10 Knowles pump for taking the mine water from the condenser pump and putting it across the lake into the launder.

We have recently installed a 10" - 6" - 10" Prescott Duplex boiler feed pump as an auxiliary to the old #5 Knowles, which was formerly used for this purpose, as it was not considered safe to have this large plant with only one boiler feed pump. This pump was made large enough to throw a stream of water in case of fire.

#### LAKE ANGELINE DRAINAGE.

The #1 emergency pump, 14" & 14" X 18" Prescott, we are preparing to move, since the ditch bringing the water to this pump has been lost by caving ground, and the discharge pipe will soon follow. This pump is only run in case of heavy rains.

We have one #10 Knowles back of the dry, which ordinarily handles the water from a large spring under the rock dump, and the waste water from the dry and steam plant, as well as the water coming from the lake bottom.

There is a #7 Cameron pumping from the open pit at the rock dump, two #5 Knowles at open pits on the south side of the lake, two #7 Knowles in the "Root House" near "B" raise.

A 14 & 10  $5/8$ " X 12" Worthington Duplex, and a #7 Knowles on the "Scow". The discharge from the scow pumps has been changed, and run

into the launder near the Lake Angeline Company's ware house, in order to pass the cave made by the Lake Superior people during the summer. This has added about 1000' more pipe to the discharge from this pump.

We have also five steam syphons, taking the water from the various pits and caves. The #2 emergency pump on Lake Superior property at the West end of the lake, is left as it was first erected. The amount of steam condensed in the 4000' of steam pipe on this lake bottom, probably is not less than 125 H.P., while the foot pounds of work actually done in lifting the water, probably does not amount to 15 H.P. This lake bottom pumping is very expensive, but unless we should substitute electric pumps I see no way to reduce the expense. Even then we will probably have some trouble in operating the motors in caves which are liable to be flooded with water, suddenly and without notice. If the water from these caves could be taken into the mine, and handled with one central plant, the expense of pumping would be very greatly reduced. As stated in my report of last year, I believe if we had electric power sufficient for the purpose, that a centrifugal pump directly connected with an electric motor would greatly reduce this expense.

#### LAKE BOILER PLANT.

The four original boilers 72" in diameter X 16' in length are still in operation as originally installed with the "Jones Under-feed Mechanical Stoker". Early last year, we put in operation a 72" X 18' boiler with the same number of flues as the other boilers, with common grates fired by hand.

This boiler apparently steams more economically than the ones with the "Mechanical Stokers", and is certainly much more of a favorite with the firemen. I hope shortly, to make tests that will enable us to get direct comparison with these stokers and the hand fired boiler.

The steam header at this plant has been entirely renewed during the past year, and now presents a much neater appearance and has so far given very good satisfaction, remaining perfectly tight. The demand for steam at this mine is very great, and these five boilers are worked as hard as they should be, about all of the time. If one boiler is shut down from any cause, the other four have ~~have~~ all they can possibly do, to

make sufficient steam to do the work. The uneconomical type of most machines in use at this mine together with the labyrinth of steam pipes, probably cause a consumption of, at the very least, three times the amount of fuel that should be burned. Any additional improvement, however, is hardly advisable on the present plant, since it will very shortly have to be moved to a new location when the new shaft is put down.

I would earnestly advise that steps be taken at once to determine the character of power we will install, so that the work may be proceeded with as soon as the shaft is located, and that we may begin reaping the benefit of the investment at the earliest possible moment.

#### THE CLEVELAND #3.

There have been no changes in this plant during the past year, except some minor repairs to the steam piping. There have been no repairs to the boilers, and they have run throughout the year without trouble. The hoisting engine of this plant has had no repairs excepting new valve stems, the old ones being worn out.

The compressor has run without interruption throughout the year, the principal repairs being some new brasses, new valve stems and new air valves. This compressor now makes from 12 to 15 million Cu.Ft. of air per month, running 20 hours per day. It is doing about all the work it can do.

The shop engine is the only auxiliary using steam from this boiler plant, except the boiler feed pump. The piping to the machine shop has given some trouble during the past year, and if required for service much longer, will need to be renewed.

During the past fall the dry was moved to a new location, about 150' from the #3 Engine House and steam heating apparatus provided. The steam for heating the dry is supplied by the exhaust from the boiler feed pump, which is ample for the purpose.

#### MORO MINE #4 ENGINE HOUSE.

The old boilers in this plant have had no repairs during the year, and have done very much better since the Cornish Pump was started, and the great demand for steam which we had while unwatering the mine,

was reduced.

The coal consumption at this mine is only about 80 tons per month during the summer, and 90 to 95 tons during the winter. The only heating required on these boilers is in the engine house, shaft house and small dry house on the 9th level in the mine.

#### CORNISH PUMP.

There has been no trouble or repairs with the engine during the year, but there have been some repairs to the pump. The rods have broken on two separate occasions, causing in one case 36 hours delay until new ones could be put in place. These rods have not been repaired since the mine was unwatered and some of them have decayed during that time. The only other repairs to the pump have been some brasses on the bob at the knuckle. This pump is badly out of balance, but we will shortly overcome this difficulty by the installment of a hydraulic balance, which is now under way.

The amount of water handled by this pump varies somewhat, but the average speed is now about 5 per minute. It varies somewhat throughout the year, being greatest during the months of greatest precipitation.

The lift is 735' and the cost per 1000 gallons of water pumped, is approximately 40 cts. The details of its operation, as to fuel consumed, water handled, etc. may be readily seen from the summary of Engineer's Logs which are attached to this report.

#### VOLUNTEER MINE.

This mine was shut down July 2nd, and the machinery was left in as good condition as when we began its operation. It was carefully laid up, being well protected from dust and corrosion, and was left in as good condition as could be.

#### MICHIGAMME MINE.

#### HOISTING PLANT.

There have been very little repairs to this plant since we began hoisting on July 1st. There has ~~not been~~ any great amount of hoisting

required, and we are hoisting only from #4 and #6 shafts. One drum has been used for pulling coal from the pocket, up on to the coal dock. The gears on these trams have so far required no repairs, but they are watched very carefully, and we fear may need repairs any time. We have had more good luck with this plant than we had expected, for which we are duly thankful.

#### COMPRESSORS.

The compressor has given us considerable trouble. We have had to put in two new crank pins, several new brasses, one new connecting rod, have lined the machine up throughout, and still it is generally running hot, and giving us no end of annoyance. The size and dimensions of this machine throughout, are entirely too light for the service required of it, and it has to be watched very closely in order to keep it going at all. We have been fortunate in anticipating repairs as much as possible, and so far have had no extended shut down.

#### CRUSHER.

We have installed a complete new crusher plant which has so far proven very satisfactory in its operation. The crusher itself, is of the Blake type, of jaw crusher built by Cleves and Son, of Houghton, Mich. It weighs about 70 tons and has a 30" X 30" opening. No block holeing or sledging of ore is necessary at this mine, as the crusher takes the ore as it is broken in the stopes.

There is a set of Lidgerwood drums in the top of the crusher house, above the crusher, which are driven by a belt from the main shaft. These pull the car up to the crusher from either shaft house, where the ore is automatically dumped, the small pieces going through a screen, the large pieces to the crusher. The cars run back by gravity from the crusher building to either shaft house. These trams have one man to operate them. This man together with a top lander in either shaft house, are the only men employed in the top tramming.

As the ore leaves the crusher it drops into a large pocket underneath, from which it is loaded into the tram car for the stock pile, or into Rail Road cars for shipment. There are two men at the pocket who

pick the rock from the ore in the shoot as it is loaded into the cars.

takes

We have arranged a system of tail rope haulage which power from the main engine for pulling the tram cars down to the stock pile, where it is automatically dumped and returning the car to the crusher house. This system is worked by one of the rock pickers, who are common laborers, so that it costs practically no more to put the ore in the stock pile than it does to load it into the Rail Road cars for shipment. This system was started about December 5th, and it has since worked uninterruptedly, with almost no attention at all. The power for both top and stock pile tram & for driving crusher is furnished by a 14" X 36" Alliss Corliss Engine taking steam from the main boiler plant, which engine runs with very little attention. There is but one man about the crusher house, aside from those already mentioned, and he performs the following duties; he is engineer, attends to the oiling, the shafting and stock pile tram system, also feeds and oils the crusher, and he together with the top tram operator, have plenty of time to spare. This entire plant has operated from the time it was first started with very slight repairs, there being practically, no repairs at all except of the wearing plates of the crusher. The crusher has removable brass shells, babbitted, and the wearing surfaces are large and ample for the work, so that the amount of oil required is much less than that required on either one of the much smaller crushers at Cliffs Shaft. This plant with its present labor, could probably handle five times the amount of ore which it is now getting, but it would not have been advisable to install a small crusher, as it would entail the expense of slegging the ore underground to make it small enough to go into the crusher.

The exhaust from the crusher heats all of the buildings and dry on the location, except the warehouse which is heated by stoves, the #4 shaft house, the main engine house and machine shop. It is an ordinary gravity heating system, and does not carry at any time over 2# back pressure on the engine.

## MINE PUMPS.

This mine makes very little water, and the original intention to install a Duplex Compound Pump, has not been adhered to.

We have a small Duplex Pump in the bottom of #6 shaft which is run by air and raises the water to the 7th level, from whence it runs into the launder, over to the #4 shaft. There is also a small pump operated by air in the bottom of #4 shaft, which raises the water to the 7th level.

There is a #7 Knowles Pump at the 11th level, which catches a considerable amount of water from other parts of the mine, which would otherwise go to the bottom of #4 shaft. This pump also raises water to the 7th level from whence it is thrown to surface by a Prescott sinking pump which was used in unwatering the mine. None of these pumps work more than a few hours per day.

## BOILER PLANT.

The boiler plant consists of three 66" X 18' boilers, which we installed a year ago in November and have run throughout the year with no expense for repairs except a few bricks in the furnace. They have about all the work they should be called upon to do, and two of them will not run the plant at all. All of the piping about the mine and boiler plant is new and has proven very satisfactory.

We have installed a coal pocket under the track leading to the crusher into which the coal is dumped from the ore car, from which it is dumped into the coal car, and hauled ~~XXXX~~ up the hill on to the coal dock by the hoisting engine, where it is automatically dumped. With this arrangement two men will unload from 15 to 20 ore cars of coal per day, and put it in the coal pile, thus avoiding teaming which was necessary from the old dock. From the coal dock it is taken directly into the boiler room in the tram car.



### IMPERIAL MINE.

The hoisting plant has given us comparatively little trouble during the past year, but it should be of larger capacity, as it is crowded very badly to handle the amount of ore required from this mine during the shipping season. It is only handling one ton skips, while we should have at least two tons.

The compressor is the 16" X 24" straight line, formerly in use at the Fitch Mine. This is a very uneconomical machine in fuel, but has not required any repairs.

### MINE PUMPS.

The pumping during the winter is all done in the west pit by the #7 pump, there is a drift connecting the east shaft with the west, and the pump in the east shaft has been shut down for the winter. We will install a #10 pump in the west shaft before spring, which will be able to handle all the water during the wet season.

### BOILER PLANT.

The two old boilers 48 X 14' at this mine, are very uneconomical and are very old. They are also greatly overworked, and if we are to operate this mine longer, we should install a new boiler about 60" or 66" X 18' in length, which would enable us to make steam for the entire mine. I believe this boiler would save its cost in fuel alone, over the present boilers in two years time.

The only other demand for steam at this mine is at the spring some 1300' south of the mine, where we have a diamond drill boiler and a #6 Knowles pump supplying water to the mine for feeding the boilers and supplying the dry. The dry is heated by exhaust from the compressor and hoist.

### WEBSTER MINE.

We have installed at the Webster Mine the 60" X 16' boiler which was formerly in the separator plant at the Michigamme Mine. There was originally a 42" X 14' boiler similar to the ones at the Imperial

Mine.

The hoist installed is the 20" X 32" Webster Camp & Lane plant formerly in use at the Fitch Mine. It was run for about two months with steam from the small boiler. We found a considerable saving in fuel when we started the larger boiler, but the mine was shut down before a sufficient test had been made, to determine the saving in fuel.

There is but very little pumping required in the Webster pit, though a #5 pump is installed there, and is run only a few hours per day.

The water for the boilers is supplied by the #5 pump located by a spring about 1000' from the boiler house, steam being supplied from the mine boiler.

The dry will be heated by steam, and will get hot water from the feed water heater in the boiler house. The heating plant was under construction, when the mine closed down.

GENERAL RECOMMENDATIONS.

I believe the general recommendations for the mines of Ishpeming and immediate vicinity are covered by the two estimates; one for electric power equipment, the other for new steam equipment.

There are still a few comparatively inexpensive changes that might be made on these old plants, that would effect some slight saving, but none that I would recommend at present, until the question of new equipment has been settled, for or against.

It is my opinion, that the best investment for the company to make would be the installation of the electric power plant.

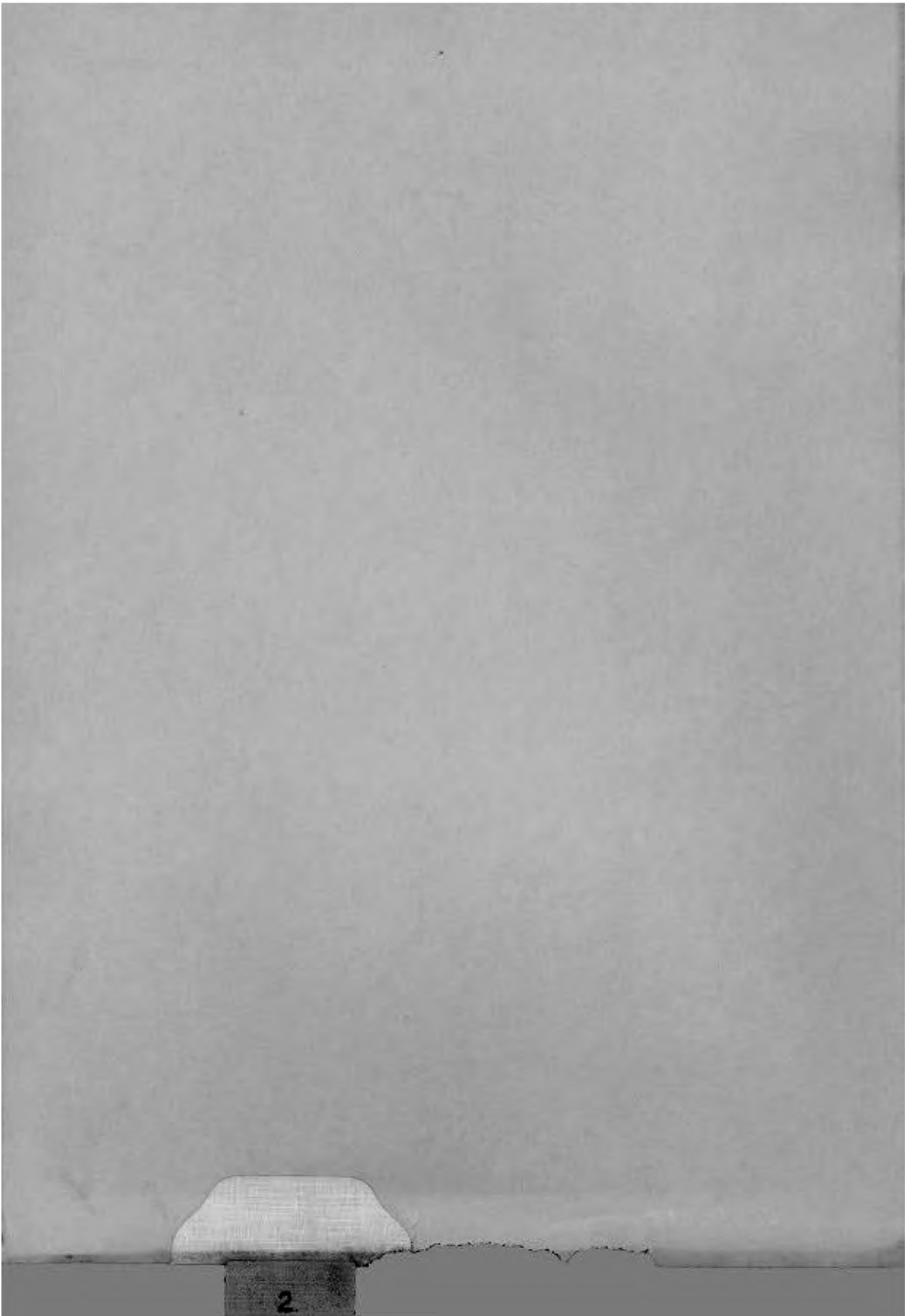
The changes I would recommend being made before spring at the Michigamme Property, is the installation of a large boiler at the Imperial Mine, as noted.

I believe our machinery generally, is in somewhat better condition throughout, than it was last year, perhaps from the fact that we have given the men considerable instruction, so that they are better able to handle the machinery in their charge. We have had fewer accidents during the year just passed, than we had during the previous year.

The men in the Mechanical Department are, without exception loyal, and the majority of them are very anxious to be informed when they are at fault, or when conditions can be improved by them.

Respectfully submitted,

*Will E. McKee*  
Master Mechanic.



ANNUAL REPORTS  
of  
STEAMER PIONEER  
1900.

## Pioneer

### GENERAL OPERATIONS:

The Pioneer sailed from the port of Cleveland on her first trip of the season April 22d, and arrived at Cleveland on her last trip, ready to lay up, on December 8, 1900, having been in commission 231 days. This steamer made 19 trips to Marquette and return to Lake Erie ports, towing the schooner Chattanooga every trip. On two of the trips, the Pioneer had cargoes of coal, going up, which were delivered at Marquette.

This steamer traveled 28,829 miles, carrying 35,348 gross tons of freight. The Average rate of freight obtained for the season was \$1.0841 per gross ton, to which should be added \$.5751, the average receipts per gross ton on account of towing the Chattanooga, making the total receipts per gross ton of freight carried \$1.6592, against \$1.4481 in 1899, an increase of \$.2111.

The cost of operating was \$.9521 per gross ton, as against \$.6422 in 1899, an increase of \$.3099 per gross ton freight carried. This increase is due not only to the higher cost of nearly everything entering into the operation of a ship over the preceding year, but also to the fact that there is an increase of \$2,400 in the General Repair account over 1899, which account is charged into Operating.

### GENERAL REPAIRS:

Considerable general repair was placed upon this steamer during the past year. While these are all mentioned in detail elsewhere in this report, mention is here made of some of the principal ones:

A new steel range light mast was erected aft, which together with the electric wiring cost \$29.99.

New hatch covers for four of the trimming hatches and four new hatch-bars for same cost \$91.47.

Bilge ceiling repairs were made at a cost of \$286.69.

The engine-room sky-light had become very defective by reason of decay and it was found necessary to remove it; it was replaced with one with iron framework and of a permanent character at a cost of \$452.68.

The original location of the life-boats, on the poop-deck of this steamer, was such that it was extremely inconvenient to handle lines, and a framework was constructed partly over the sky-lights, upon which to carry these life-boats, thus giving room for the proper working of the lines. This work cost \$116.04

Pioneer

A new wheel was put on the Pioneer. The cost of the wheel itself was \$487.85, and the cost of docking, in connection with putting same on the ship, \$288.22, making the total cost \$776.07. In a general way it had been concluded that the wheel which the Pioneer originally had was not suitable for towing. The matter was given into the hands of Mr Robert Logan for investigation, who reported as follows:

"In accordance with your instructions, I visited the Pioneer and talked with her engineer in regard to her performance intowing the Chattanooga. I went over the vessel's logs for this year, making a comparison of them with some of the previous years, with the following results:

	1	2 - 3	4 - 5	6		
Coal per mile,	213#	115#	203#	219#		
Tons cargo moved one mile per lb. coal,	17	0	14	25	28	26
Speed per hour,	8.5	14.0	12.1	8.3	7.5	8.9
Propeller slip %,	28	1.0	7.0	30.0	39.0	

No.1 is towing "Fontana" down loaded in June 1897,  
No.2 is running alone up light, July 1898,  
No.3 is running alone down loaded, " "  
No.4 is towing "Chattanooga" up loaded, May 1899 ,  
No.5 is towing "Chattanooga" down, " "  
No.6 is towing "Chattanooga" " " "

From this it will be seen that the coal consumption and speed are about the same as when towing the "Fontana" and that the tons cargo moved over one mile per lb. of coal burned are much greater, and it further shows that the slip of the propeller when towing is extremely excessive. In calculating to get the correct pitch for the work the vessel is engaged in, I find that 13'6" would be sufficient, whereas the present propeller has 15'9", and I would, therefore, recommend that better results would be obtained by changing the propeller and fitting one, say--14'0" pitch with increased area of blades."

The repairs necessary on this boat before she goes into commission again will not be made up of large items, but of numerous minor ones, and will be those usually current each year, with the exception of the installation of an independent force pump, to take the place of the two force pumps now in the engine room, which are worn out. This new pump will cost about \$200.00.

ACCIDENTS:

STRANDING, MOUTH OF ST CLAIR RIVER, MAY 31st. According to the Captain's protest, the Pioneer with the Chattanooga in tow arrived at a point in the St Clair River just below Port Huron about 7 o'clock pm: May 31st, where, a thick fog having set in, it became necessary to round to for clear weather. In rounding to, the bight of the tow line caught on the bottom, and was cut and parted in the middle. The vessels proceeded on their voyage until about 1:15 on the morning of June 2d, when, the vessels being under check, the Chattanooga went aground on the east side of the channel near Bar Point Light-ship. The Pioneer was under double check, in order to get the tow-line in, and in this was she lost her headway, and she went aground on the east bank of the channel. Tugs were sent for and got the vessels off. The cost for doing this work amounted to \$521.59,

Pioneer

and claim for this amount has been forwarded to our underwriters. It is thought that some damage was sustained by her bottom, but this can only be determined when the steamer is dry-docked.

DAMAGE TO STAR ISLAND DOCK, SEPTEMBER 18th. The Pioneer had gone to the Star Island dock to telephone to Capt. Westcott at Detroit for a lighter on account of the Chattanooga being aground in Lake St. Clair just below the end of the cut. The Pioneer in getting away from the dock, did not get her stern line cast off quickly enough, and the current catching the vessel, she pulled rather heavily on the line. The line had been fixed in an iron hook in the corner of the dock, and the strain pulled out the corner of the dock. Settlement was made with the Star Island Dock people for \$125.00. This damage was due to the people on the Pioneer not exercising due caution in getting their line cast off quickly enough.

COLLISION WITH BRIDGE ABUTMENT, BUFFALO CREEK, DECEMBER 1st. On her last trip, the Pioneer was going up Buffalo Creek in tow of the tug Herbert. The Pioneer's engines were working slowly ahead as she went up the river, but about the time the tug blew for the Ohio Street Bridge, she gave the Pioneer a signal to stop her engines, which was done. The tug then pulled off to port, in order to make the bend and take the Pioneer through the draw of the bridge on the port side. The Pioneer's forefoot, however, struck the rock bottom just at the entrance of the draw, about four feet from the center pier of the bridge, damaging the forefoot, breaking the stem iron and damaging some plates. This vessel will consequently have to go into dry dock for repairs, before going into commission again.



Pioneer

	1899		1900	
	Days	Percent	Days	Percent
Time in port, . . . . .	79	36.4	69	29.9
Time sailing, . . . . .	129	59.4	139	60.2
Time lost by bad weather, . . . . .	7	3.2	11	4.8
Time lost waiting at Soo Canal and River, . . . . .	2	1.0	5	2.1
Time lost by accidents, . . . . .			7	3.0
	217	100.	231	100.
Number of trips made, . . . . .	19		19	
Number of cargoes carried, . . . . .	26		21	



Pioneer

Comparisons

	1899	1900
Days in Commission,.....	217	231
Number miles traveled,.....	26,490	28,829
Number trips made,.....	19	19
Number cargoes freight carried,.....	26	21
Gross tons freight carried,.....	40,391	35,348
Average rate freight per gross ton,.....	\$ 1.4481	\$ 1.6592
Average cost to carry per gross ton freight,.....	.6422	.9521
Net earnings per ton freight carried,.....	\$ .8059	\$ .7071
Gross Receipts,.....	\$ 58,491.78	\$ 58,650.19
Gross Expenditures,.....	25,937.19	33,654.20
Net Earnings,.....	\$ 32,554.59	\$ 24,995.99
Percentage of Operations to Earnings,.....	44.3	57.4
Gross Earnings per mile traveled,.....	\$ 2.2081	\$ 2.0344
Operating Expenses per mile traveled,.....	.9791	1.1674
Net Earnings per mile traveled,.....	\$ 1.2290	\$ .8670
Gross Earnings per day.....	\$ 269.55	\$ 253.89
Operating Expenses per day,.....	119.53	145.69
Net Earnings per day,.....	\$ 150.02	\$ 108.20
Expenses per day excluding cargo handling costs,.....	\$ 97.00	\$ 113.61
Cost provisions per man per day (excluding extra meals).....	\$ .314	\$ .305
Average tons coal consumed per mile steamed,.....	<u>187</u> 2000	<u>166</u> 2000
Average cost coal consumed per mile steamed,.....	\$ .1953	\$ .2210
Average tons coal consumed per hour steamed,.....	<u>1600</u> 2000	<u>1431</u> 2000
Average cost oil consumed per hour steamed,.....	\$ .0380	\$ .0486
Average cost oil consumed per mile steamed,.....	\$ .00442	\$ .00562
Average wages paid per day while in commission,.....	\$ 25.63	\$ 29.36
Average ore cargo from Lake Superior,.....	1766	1772
Average draft water on ore cargoes from Lake Superior.....	15'8" for'd 16'2" aft	15'10" ford. 16'4" aft.
Pioneer waiting for Chattanooga during season,.....	17 days, 11 hrs	11 days 19hrs
Pioneer's percentage of time waiting for Chattanooga,.....	8.04	5.10

Pioneer

Comparison of Items of Disbursement.

	1 8 9 9	1 9 0 0	+ or -	Remarks
Extraordinary and General Repairs,.....	702.69	3,103.55	+ 2,400.86	See reference elsewhere---Under General Repairs.
Ship Keeping and Winter Dockage,.....	109.75	95.00	- 14.75	
Fitting Out,.....	1,289.53	1,615.46	+ 325.93	Machinery Repairs bill \$299.62
Wages and Captain's Salary,.....	6,708.93	7,962.66	+ 1,253.73	Wages advanced on average of 14.5% on this boat.
Captain's Expense Account,.....	66.71	68.04	+ 1.33	
Tug Services,.....	176.90	156.29	- 20.61	
Handling Cargoes,.....	4,888.41	7,409.80	+ 2,521.39	Increase in cost of handling cargoes.
Cargo Commissions,.....	150.00		- 150.00	
Taxes,.....	385.36	195.83	- 189.53	Rate of taxation decreased.
Marine Insurance,.....	3,775.38	3,814.50	+ 39.12	
Freight List Insurance,.....	31.40	26.80	- 4.60	
Mate's Supplies,.....	173.00	284.12	+ 111.12	
Provisions,.....	1,182.31	1,223.06	- 39.50	Based on decreased cost of \$.009 per man per day.
Steward's Supplies,.....	116.37	88.62	- 27.75	
Fuel,.....	5,174.95	6,544.52	- 800.30	Based on decreased consumption of 21 lbs. per mile.
Engineer's Lubricants,.....	117.22	162.14	+ 34.59	Based on increased cost of \$.00120 per mile.
Engineer's Supplies,.....	49.08	168.53	+ 119.45	
Boiler Repairs,.....	37.99	38.69	+ .70	
Machinery Repairs,.....	8.71	50.78	+ 42.07	
Auxiliary Engine Repairs,.....	10.10	6.70	- 3.40	
General Expense,.....	235.07	230.75	- 4.32	
Laying Up,.....	547.33	408.36	- 138.97	

STEAMER "PIONEER".

DETAILS OF THE PROVISION A/C.

	1899			1900		
	QUANTITY	AVG. PRICE	AMOUNT	QUANTITY	AVG. PRICE	AMOUNT
Sugar	985 lbs.	.055	\$54.65	1110 lbs.	.058	\$64.68
Tea	38 "	.37	14.05	40 "	.35	13.85
Coffee	245 "	.118	29.07	127 "	.15	19.05
Spices and vinegar			7.29			7.37
Extracts	15 btls.	.212	3.18	13 btls.	.30	3.85
Baking powder	56 lbs.	.21	11.87	36 btls.	.19	7.09
Bread and crackers,			38.82			23.67
Butter and butterine	396 lbs.	.18	71.13	483 lbs.	.18	88.80
Lard and cottolene	150 lbs.	.088	16.76	275 "	.09	23.50
Cheese	44 "	.136	6.01	31 "	.14	4.48
Fresh Milk	245 Gal.	.20	49.09	219 Gal.	.21	46.16
Condensed milk	65 cans	.097	6.31	97 cans	.10	9.59
Pickles			5.40			4.43
Sauces			5.10			3.58
Eggs	255 doz.	.160	40.90	284 doz.	.16	45.75
Flour	8 bbls.	4.75	38.08	12 bbls.	4.45	53.54
Buckwheat, Graham & cornmeal,	171 lbs.	.025	4.25	176 lbs.	.02	3.95
Farinaceous foods	186 "	.040	7.54	132 "	.04	5.81
Canned fruits	9 cans	.293	2.64	117 cans	.10	11.90
Canned vegetables,	218 cans	.077	16.81	160 cans	.08	12.74
Dried fruits	101 lbs.	.104	10.51	149 lbs.	.13	19.45
Dried vegetables,	195 lbs.	.031	6.07	102 lbs.	.04	4.08
Fresh fruits,			36.42			28.23
Fresh vegetables,			48.23			62.59
Potatoes,	105 bu.	.582	61.17	117 Bu.	.54	63.50
Dried Onions,	10 pks.	.323	3.23	14 pks.	.34	4.75
Fresh Fish			10.49			17.22
Salt Fish			3.25			7.02
Fresh Meat	3529 lbs.	.098	345.60	3868 lb.	.09	334.66
Salt meat	1825 lbs.	.068	125.57	1368	.09	123.14
Molasses and syrups	179 gal.	.356	6.05	13 gal.	.36	4.82
Ice	513 Cwt.	.174	89.55	548 cwt.	.175	96.11
Miscellaneous			7.22			3.80
			\$1182.31			\$1223.06

Average consumption of meat per man per day was 1.34 lbs. in 1900.

" " " " " " " " " 1.29 " " 1899

STEAMER "PIONEER"

DETAILS OF STEWARD'S SUPPLIES A/C.

	1899	1900
Table linen, towelling, etc.,	\$12.40	\$47.97
Bed linen, blankets, etc.		7.10
Cutlery, spoons, etc.	2.55	.15
Crockery and glass,		6.01
Kitchen utensils,	16.87	1.36
Soap,	17.95	12.33
Scouring material,	6.11	7.88
Brooms,	1.82	1.41
Brushes,	1.53	.39
Laundry	42.09	57.52
Sundries	15.05	7.31
	\$116.37	
Supplies used in fitting out and laying up in 1899,	97.68	
TOTAL,	\$214.05	\$149.43

STEAMER "PIONEER".

DETAILS OF MATE'S SUPPLIES ACCOUNT.

	1899	1900
Canvas, Duck, &c.,	\$3.36	\$19.45
Kerosine Oil,	90.72	31.21
Ropasm etc.	18.25	229.20
Hose,	12.00	13.00
Lamp Chimneys & Globes,	4.45	7.91
Lamps, lanterns and burners,	4.33	13.58
Soap,	6.36	7.85
Scouring material,	1.70	5.86
Rags,	1.41	3.75
Hardware and tools,	3.96	15.83
Brushes,	.80	8.10
Brooms,	5.26	9.50
Candles,	2.00	5.95
Flags	6.40	
Sundries,	12.00.	32.41
	\$173.00	
Amount supplies used in fitting out and laying up in 1899,	120.92	
<b>TOTAL,</b>	\$293.92	\$403.60

STEAMER "PIONEER".

DETAILS OF ENGINEER'S SUPPLIES ACCOUNT.

	1899	1900
Tools and hardware,	\$4.05	\$25.40
Lamps and wicking,	2.88	8.44
Lye and scouring material,	4.87	3.71
Soap,	5.80	4.25
Rags and waste,	4.50	10.40
Brooms,	.50	7.78
Brushes,	.40	2.19
Water glasses,	1.24	.50
Valves,	2.42	58.03
Fittings and pipings,	2.32	123.33
Gaskets,	7.02	13.74
Packing,	7.33	57.93
Kerosine Oil	.95	
Sundries	4.80	16.05
	\$49.08	
Supplies used in fitting out and laying up in 1899,	195.44	
TOTAL,	\$244.52	\$331.75



STEAMER "PIONEER".

FUEL PURCHASED ----- FOR TWO SEASONS.

GRADE	1 8 9 9					1 9 0 0				
	TONS		PER CENT	AVERAGE PRICE	TOTAL COST	TONS		PER CENT	AVERAGE PRICE	TOTAL COST
Lump	1261	300	51.1	\$2.270	\$2,862.64	612	1000	24.7	\$2.929	\$1,794.07
Run of Mine	829	1600	33.6	2.030	1,684.70	245	1100	9.9	2.793	685.71
Nut	79	1500	3.2	1.760	140.38	409	400	16.5	2.644	1,082.29
Slack	299	1300	12.1	1.626	487.23	1,212	1000	48.9	2.459	2,982.45
Totals,	2470	700	100.0	\$2.095	\$5,174.95	2,479	1500	100.0	\$2.639	\$6,544.52

STEAMER "PIONEER"

DETAILS OF CAPTAIN'S EXPENSE ACCOUNT.

	1899	1900
Telegrams and telephones,	\$35.25	\$57.33
Postage	3.92	9.30
Railway fares,	5.35	11.94
Customs	8.48	7.60
Exchange	3.20	.12
Stationery	1.61	1.50
Express	2.90	.25
Medicine	5.00	
Legal Expense	1.00	
Captain's Board,		7.90
	<del>\$66.71</del>	
TOTAL	\$66.71	\$75.94

VICTORY BOND

STEAMER "PIONEER"

STATEMENT OF GENERAL & EXTRAORDINARY REPAIRS ----- ELABORATED.

Total amount of repairs was \$3,268.39.

	MACH. REPAIRS	BOILER REPAIRS	HULL REPAIRS	DECK REPAIRS	CABIN REPAIRS	BUL- WARKS & RAIL REPAIRS	MISC. REPAIRS
Wire cable and labor splicing same,							12.42
Repairs to steering gear,	53.96						
Repairs dead lights							27.24
Repairs ice box							8.64
Repairs to clocks							2.00
Repairing electric lights					11.27		
Repairs to fender hook							.75
Life boat covers, lengthening life boat davits and new saddles,							173.32
New skylight engine room & galley							452.58
New pole for range light							29.99
Repairs to railing in quarter deck						20.65	
Asbestos covering for kitchen floor							1.73
Sheet lead for forward steps							7.70
Repairs engine room and crank pit floor			9.17				
Repairs pipe railing around poop deck						29.86	
Piping in galley							2.49
Repairs crank shaft	2.40						
Repairs armature	1.45						
Putting patches on boiler		163.65					
Labor and material in making changes in propeller wheel	776.07						
Tug service in moving boat to dry dock							15.64
Glass for windows						5.35	
Sundry repairs to lamps							4.30
Repairs fire tools							.40
Repairs to hatches,				109.16			
Sundry repairs to hold, painting and apraing new flooring, etc.			477.34				
Repairs cabin floors and ceilings,					311.02		
Repairs deck flooring				15.82			
Repairs bilge ceiling,			342.15				
Paints used,							252.73
<i>(Paints used in 1899 cost \$130.96)</i>	779.92	163.65	828.66	124.98	327.64	50.51	993.03

STEAMER "PIONEER"

STATEMENT SHOWING TIME DISCHARGING ORE CARGOES.

NO. CARGOES	NAME OF DOCK	AV. TIME AT DOCK		AV. TIME AT DOCK DISCHARGING		AV. TIME ACTUALLY AT WORK	
		DAYS	HOURS	DAYS	HOURS	DAYS	HOURS
15	Lehigh Valley R'y, Buffalo, N.Y.	1	16		22		10
2	Buffalo Fce. Co., Buffalo, N.Y.	4	2	1	5		16
1	E & P R'y, Erie, Pa.		16		13		10
1	P Y & A R'y, Ashtabula, O.	1	7	1	5		17
19	Grand Average,	1	21		23		15

Pioneer

GENERAL DATA

Total number of crew (including Master and Engineer).....	17
Length over all,.....	241 feet
Keel, .....	225 "
Beam,.....	35 "
Depth,.....	17 "
Net tonnage,.....	774 tons
Gross tonnage,.....	1,123 "
Ore capacity,.....	1,772 "
Coal capacity,.....	1,532 "
Engines,.....	20,23,54 X 42
Boilers,.....	2 scotch 12 X 11-1/2
Steam,.....	160
Horse Power,.....	1,223
Pitch of wheel,.....	15'9"
Average revolutions per minute, loaded,.....	72
Average revolutions per minute, light,.....	78
Number of hatches,.....	( 6 working hatches, ( 4 intermediate hatches
Average miles per hour, running alone, light,.....	13.38
Average miles per hour running alone, loaded,.....	12.20
Average miles per hour towing Chattanooga, light,.....	8.98
Average miles per hour towing Chattanooga, loaded,.....	8.39

ANNUAL REPORT  
of  
STEAMER CADILLAC  
1900.

## C a d i l l a c

### GENERAL OPERATIONS:

The Cadillac sailed from the port of Manitowoc, Wis. on her first trip, with a cargo of wheat, on April 22, 1900, and arrived at Cleveland on her last trip ready to lay up, on December 7, 1900, having been in commission 230 days. She made 25 trips, carrying 29 cargoes of freight.

This steamer traveled 30,074 miles, carrying 63,814 gross tons of freight, from which the net profits were \$32,692.92. The average rate of freight received was \$1.0246 per gross ton, against \$.6328 in 1899, an increase of \$.3918. With exception of the first trip, the vessel was engaged carrying iron ore from Upper Lake ports to Lake Erie ports during the whole season. On three of the up trips, cargoes of coal were carried to Marquette, and one cargo to Milwaukee.

The cost of operating was \$.5123 per gross ton, as against \$.4980 in the previous year, an actual increase of but \$.0143 per gross ton freight carried. During the season, however, the vessel had some extensive repairs made, which brought up the cost per ton. Eliminating this repair item, makes the cost per ton \$.4702 for 1899. The natural increase, therefore, of 1900 over 1899 shows to be \$.0421 per ton. This increase is due to an advance in such items as rate of wages, cost of handling cargoes, price of fuel, etc.

### GENERAL REPAIRS:

There have been no items of repair on the Cadillac, the past season of any large amount, such repairs as have been made being those incident to every season.

For the coming season, in addition to repairs of the usual character, the most important item will be the replacing of the wooden floor ceiling with new. The putting in of this ceiling, with its attendant scraping and painting of the tank top, will cost in the neighborhood of \$1400.00.

### ACCIDENTS:

## C a d i l l a c

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### ACCIDENTS:

But one accident is charged to the record of this steamer, that being when she stranded on Belle Isle, Detroit River, April 24th. About 11:30 pm on this date, coming down on the Wind Mill Point range, when near Belle Isle, the Wheelman put the wheel the wrong way, causing the Cadillac to sheer towards Belle Isle, where she went hard aground, running <sup>out</sup> about four feet forward. She was released by tugs after several



C a d i l l a c

hours work. The Wheelsman seemed to have been dazed for some reason or other, and put the wheel in the opposite direction to the order given by the master. The wheelsman says that he cannot offer any explanation as to the mental action that caused him to do this. The cost of getting the vessel afloat was \$229.60, and claim for this amount has been sent to our underwriters.

---

C a d i l l a c

	1 8 9 9		1 9 0 0	
	Days	Percent	Days	Percent
Time in port,.....	82	36.5	98	42.6
Time sailing,.....	127	56.5	123	53.5
Time lost by bad weather,.....	12	5.3	3-1/2	1.5
Time lost waiting at Soo Canal and River,.....	1	.4	5	2.2
Time lost going through Welland Canal,	2	.9		
Time lost by accidents,.....	1	.4	1/2	.2
Total time in Commission,.....	225	100.	230	100.
Number of trips made,.....	26		25	
Number of cargoes carried,.....	28		29	

C a d i l l a c

<u>Receipts</u>	Gross Tons	Amount	Per gross ton freight carried.
8 cargoes ore from Escanaba,.....	18,943	\$18,943.00	\$1.00
16 " " " Marquette,.....	37,230	41,182.40	1.1062
1 " wheat from Manitowoc (67,500 bus. at \$.02-1/2).	1,808	1,687.50	.9333
1 " coal to Milwaukee, (2,053 net tons at \$.65)....	1,833	1,334.63	.7281
3 " " " Marquette, (4,480 " " " \$.50)....	4,000	2,240.23	.5600
29 cargoes,                      T o t a l s ,	63,814	\$65,387.76	\$1.0246
<u>Disbursements.</u>			
Extraordinary and General Repairs.....	\$ 573.87		
Ship Keeping and Winter Deckage,.....	112.00		
Fitting Out, .....	458.01		
Wages and Captain's Salary,.....	7,356.00		
Captain's Expense Account,.....	46.58		
Tug Services,.....	424.17		
Handling Cargoes,.....	12,758.69		
Cargo Commissions,.....	35.00		
Taxes,.....	186.51		
Marine Insurance,.....	3,814.50		
Mate's Supplies,.....	358.16		
Provisions,.....	1,204.88		
Steward's Supplies,.....	213.93		
Fuel,.....	4,207.51		
Engineer's Lubricants,.....	83.03		
Engineer's Supplies,.....	57.32		
Boiler Repairs,.....	16.35		
Machinery Repairs,.....	26.22		
General Expense, (Telegrams, Dues, Lake Carriers Assn etc).	333.92		
Laying Up,.....	383.12		
Freight List Insurance,.....	45.07	\$32,694.84	\$ .5123
N e t E a r n i n g s ,		\$32,692.92	\$ .5123
Add Amount received account overrun of grain cargo,	\$ 36.50		
Deduct amount not allowed by Ins.Co. in adjustment of claims,	8.95	27.55	
Making total net gain for season 1900,		\$32,720.47	

C a d i l l a c

Comparisons

	1 8 9 9	1 9 0 0
Days in Commission,.....	225	230
Number of Miles traveled,.....	31,074	30,074
Number trips made,.....	26	25
Number cargoes freight carried,.....	28	29
Gross tons freight carried,.....	62,042	63,814
Average rate freight per gross ton,.....	\$ .6328	\$ 1.0246
Average cost to carry per gross ton freight,.....	.4980	.5123
Net earnings per ton freight carried,.....	\$ .1348	\$ .5123
Gross receipts,.....	\$ 39,261.24	\$ 65,387.76
Gross Expenditures,.....	30,898.81	32,694.84
Net Earnings,.....	\$ 8,362.43	\$ 32,692.92
Percentage of Operations to Earnings,.....	78.7	50.0
Gross Earnings per mile traveled,.....	\$ 1.2635	\$ 2.1742
Operating Expenses per mile traveled,.....	.9944	1.0871
Net Earnings per mile traveled,.....	\$ .2691	\$ 1.0871
Gross Earnings per day,.....	\$ 174.49	\$ 284.29
Operating Expenses per day,.....	137.33	142.15
Net Earnings per day,.....	\$ 37.16	\$ 142.14
Expenses per day excluding cargo handling costs,.....	\$ .93.09	\$ 86.68
Cost provisions per man per day (Excluding extra meals) ....	\$ .299	\$ .325
Average tons coal consumed per mile steamed,.....	<u>110</u> 2000	<u>107</u> 2000
Average cost coal consumed per mile steamed,.....	\$ .1112	\$ .1399
Average tons coal consumed per hour steamed,.....	<u>1124</u> 2000	<u>1095</u> 2000
Average cost oil consumed per hour steamed,.....	\$ .0146	\$ .0281
Average cost oil consumed per mile steamed,.....	\$ .00143	\$ .00276
Average wages paid per day while in commission,.....	\$ 24.83	\$ 27.61
Average ore cargo from Lake Superior,.....	2,354	2,327
Average draft water on ore cargoes from Lake Superior,.....	(16'5" for'd 16'10" aft	16'3" for'd 16'8" aft.

Cadillac

Comparison of items of Disbursement.

	1899	1900	+ or -	Remarks
Extraordinary and General Repairs,.....	\$ 2,538.65	\$ 573.87	\$ - 1,964.78	Extensive repairs in 1899, viz. new hatch covers, new rudder, starboard bracket, etc.
Ship Keeping and Winter Dockage,.....	109.75	112.00	+ 2.25	
Fitting Out,.....	1,093.47	458.01	- 635.46	In 1899 the Mate's and Steward's Supply Accounts were \$428.27; in 1900 were \$31.65.
Wages and Captain's Salary,.....	6,863.85	7,356.00	+ 492.15	Rate of wages increased in 1900, besides vessel in commission 5 days more.
Captain's Expense Account,.....	61.82	46.58	- 15.24	
Tug Services,.....	485.20	424.17	- 61.03	Rate of towing increased in 1900, but vessel went in and out of port 5 times in 1900 without tug.
Handling Cargoes,.....	9,953.56	12,758.68	+ 2,805.12	Increase in cost of unloading ore cargoes.
Cargo Commissions,.....	35.00	35.00		
Taxes,.....	367.05	186.51	- 180.54	Rate of Taxation decreased.
Marine Insurance,.....	3,775.37	3,814.50	+ 39.13	
Freight List Insurance,.....	31.33	45.07	+ 13.74	More freight carried in 1900.
Mate's Supplies,.....	345.21	358.16	+ 12.95	
Provisions,.....	1,088.01	1,204.88	+ 95.68	Based on increased cost of \$.026 per man per day.
Steward's Supplies,.....	172.32	213.93	+ 41.61	
Fuel,.....	3,454.25	4,207.51	- 119.25	Based on saving of 3 lbs. per mile run.
Engineer's Lubricants,.....	44.60	83.03	+ 39.99	Based on increased cost of \$.00133 per mile run.
Engineer's Supplies,.....	38.79	57.32	+ 18.53	
Boiler Repairs,.....	5.00	16.35	+ 11.35	
Machinery Repairs,.....	7.45	26.22	+ 18.77	
General Expense,.....	71.57	333.92	+ 262.35	In 1900 paid Capt. Symes reward of \$100 and D J Symes \$54.50 on account of personal injury; also donations authorized by office \$46.43
Laying Up,.....	356.56	383.12	+ 26.56	

STEAMER "CADILLAC"

DETAILS OF PROVISION ACCOUNT.

	1899			1900		
	QUANTITY	AVG. PRICE.	AMOUNT	QUANTITY	AVG. PRICE	AMOUNT.
Sugar	1138 lbs.	\$.054	\$62.05	929 lbs.	\$.05	\$50.90
Tea	49 "	.346	17.00	48 "	.34	16.61
Coffee	204 "	.112	22.89	179 "	.13	25.82
Spices and vinegar			3.40			7.70
Extracts	6 btls.	.30	1.80	29 btls.	.21	6.14
Baking powder	26 lbs.	.208	5.42	40 Btls.	.23	9.26
Bread and crackers			17.54			22.54
Butter and butterine	527 lbs.	.174	93.78	593 lbs.	.19	114.70
Lard and cottolene	341 "	.079	27.14	293 "	.09	25.00
Cheese			8.32	98 "	.14	14.28
Fresh Milk	225 gal.	.19	42.89	317 gal.	.19	60.00
Condensed milk	78 cans	.085	6.74	108 cans	.10	10.58
Pickles			5.93			7.45
Sauces			3.15			5.43
Eggs	251 doz.	.154	38.63	264 doz.	.16	41.67
Flour	9 bbls.	4.09	36.79	9 bbls.	4.20	38.06
Buckwheat Graham & Cornmeal	57 lbs.	.018	1.02	175 lbs.	.03	5.03
Farinaceous foods	125 lbs.	.034	4.33	175 lbs.	.06	10.64
Canned Fruits	34 cans	.26	8.45	152 cans	.11	16.83
Canned vegetables	284 cans	.07	20.10	296 cans	.08	24.16
Dried fruits	79 lbs.	.104	8.23	247 lbs.	.08	26.87
Dried vegetables	8 lbs.	.025	.20	75 lbs.	.06	4.30
Fresh fruits			35.10			26.96
Fresh vegetables			31.54			48.09
Potatoes	108 Bu.	.575	62.10	118 Bu.	.47	55.50
Dried Onions	6 pks.	.28	1.68	12 pks.	.33	3.90
Fresh fish			15.01			19.71
Salt fish,			9.08			11.03
Fresh Meat	3130 lbs.	.094	296.88	2919 lbs.	.10	289.50
Salt meat	1478 "	.065	97.39	978 "	.09	91.49
Molasses & Syrups	6 Gal.	.316	1.90	11 Gal.	.49	5.43
Ice	975 Cwt.	.16	92.34	630 Cwt.	.17	107.10
Miscellaneous			9.19			2.20
			\$1088.01			\$1204.88

Average consumption of meat per man per day in 1900 was 1.06 lbs.

" " " " " " " " " 1899 " 1.28 "

STEAMER "CADILLAC"

DETAILS OF STEWARD'S SUPPLIES ACCOUNT.

	1899	1900
Table linen, towelling, etc.,	\$1.50	\$62.54
Bed linen, blankets, etc.	10.98	8.69
Cutlery, spoons, etc.	1.45	2.03
Crockery and glass,	9.40	10.95
Kitchen utensils,	18.70	13.92
Soap,	9.93	8.28
Scouring material	5.97	6.52
Brooms,	.80	1.96
Brushes,	.18	.45
Laundry	95.27	89.30
Hardware,	4.95	
Sundries	13.19	34.01
TOTAL,	\$172.32	
Amount supplies used in fitting out and laying up in 1899,	181.35	
TOTAL,	\$353.67	\$238.65

STEAMER "CADILLAC"

DETAILS MATE'S SUPPLIES ACCOUNT.

	1899	1900
Canvas, duck, etc.	\$9.71	\$2.25
Kerosine Oil,	86.39	57.41
Ropes, etc.	139.61	191.27
Hose,	.60	
Lamp Chimney & Globes,	1.95	2.53
Lamps, lanterns and burners,	3.88	5.76
Soap,	4.80	4.50
Scouring material,	2.04	7.04
Rags	2.15	5.00
Hardware & Tools,	14.95	12.85
Brushes,	5.65	4.75
Brooms,	4.01	9.10
Wandles,	7.95	4.00
Sundries,	8.66	69.12
Compass	26.00	
Sperm Oil,	16.76	
Stools,	7.10	
Charts	3.00	
	\$345.21	
Amount supplies used in fitting out and laying up in 1899,	265.10	
TOTAL,	\$610.31	\$375.58



STEAMER "CADILLAC"

DETAILS OF ENGINEER'S SUPPLIES ACCOUNT.

	1899	1900
Tools and hardware,	\$12.27	\$2.16
Lamps and wicking,	1.59	6.50
Lye and scouring material	2.93	7.62
Soap	.42	2.77
Rags and waste	1.00	4.60
Brooms	1.00	2.70
Brushes	.25	.80
Squirt cans and fillers	5.80	
Water glasses	.15	
Valves	4.21	2.99
Fittings and pipings,	3.64	7.67
Gaskets		3.59
Packing	1.28	31.48
Sundries	4.25	24.18
TOTAL	\$38.79	
Amount supplies used in fitting out and laying up in 1899,	109.75	
	\$148.54	\$97.06

STRAMER "CADILLAC"

FUEL PURCHASED.

FOR TWO SEASONS.

GRADE	1 8 9 9				1 9 0 0					
	TONS		PER CENT	AVERAGE PRICE	TOTAL COST	TONS		PER CENT	AVERAGE PRICE	TOTAL COST
Lump	592	1500	34.6	\$1.993	\$1,181.56	542	200	33.6	\$2.758	\$1,494.86
Run of Mine,	816	200	47.6	2.039	1,663.75	467	1300	28.8	2.627	1,228.45
NUT	304	500	17.8	2.001	608.94	189	1600	11.7	2.562	486.28
Slack						419	1300	25.9	2.378	997.92
TOTALS	1713	200	100.0	\$2.017	\$3,454.25	1619	500	100.0	\$2.598	\$4,207.51

STEAMER "CADILLAC"

DETAILS OF CAPTAIN'S EXPENSE ACCOUNT.

	1899	1900
Telegrams and Telephones,	\$28.42	\$20.22
Postage	3.50	7.36
Rail-way fares,	1.45	5.76
Customs	11.70	10.00
Exchange	1.00	.65
Stationery	9.60	1.60
Express	.25	1.01
Medicine	.40	
Elevator men	4.00	
Tug for signalling place at ore dock,	1.50	
Gratuity to dock men		3.00
Expense shipping fireman in Huron,		1.00
Captain's and engineer's board,		21.90
	\$61.82	
Expense in fitting out and laying up in 1899	81.18	
TOTAL,	\$143.00	\$72.50

STEAMER "CADILLAC"

STATEMENT OF GENERAL AND EXTRAORDINARY REPAIRS, --- ELABORATED.

Total amount of repairs for 1900 was \$591.41.

	MACH. REPAIRS	BOILER REPAIRS	HULL REPAIRS	DECK REPAIRS	CABIN REPAIRS	BULWARKS & RAIL REPAIRS	MISC. REPAIRS
Repairing oil pipe							1.20
Making cap for ventilator							.65
New wash bowl and labor on same					4.25		
New fenders and repairs			11.57				
Sheet brass for door combing							1.35
Repairs to platform on upper deck				9.32			
Glass for sky-light over engine room							.63
Clock for pilot house							14.35
Repairing oil tank							3.00
Repairing locks on dead lights							1.40
Supplies and labor making platform for kedge anchor				17.79			
Repairs to range,							13.09
Repairs to floor in hold,			6.00				
Repairs water tank,							1.65
Adjusting compass,							40.00
Wire for whistle,							.68
Repairs to floor and fender straps,			21.05				
Repairs steering gear,	61.68						
Repairs to ice box,							2.50
Repairs to hatch,				.73			
Glass and setting same					2.50		
Repairs to bulwarks around stern and new decking,						163.99	
Repairing bad spots in floor ceiling			13.55				
Repairs to lamps,							7.65
Repairs to fire tools,							4.41
Sundry repairs to tin ware,							3.45
Paints used,							182.97
	61.68		52.17	27.84	6.75	163.99	278.90

*(Paints used in 1899 cost \$177.84)*

STEAMER "CADILLAC"

STATEMENT SHOWING DETAILS OF FUEL CONSUMPTION FOR SEASON 1900.

TRIP NO'S	MILES RUN	KIND OF FUEL PURCHASED	LBS. PER MILE	TOTAL COST OF FUEL CONSUMED, USING PITTS. COAL CO.'S PRICES.	TOTAL TONS USED	DISTRIBUTION OF CONSUMPTION.	COST PER MILE
2	1297	Nut & Slack	102	\$161.30	66	9 tons lump @ \$2.75 13 tons Nut @ 2.55 44 tons slack @ 2.35	\$.1244
3 7 14 23	4632	Lump	105	667.30	245	218 tons Lump @ \$2.75 17 tons R.of M. @ 2.65 10 tons Slack @ \$2.35	.1440
4	1138	Slack	123	170.90	70	16 tons Lump @ 2.75 54 tons Slack @ 2.35	.1501
5 8 11 16 20	5743	Run of Mine and Slack	103	744.50	297	8 tons Lump @ \$2.75 289 tons R. of M. & S at \$2.50	.1296
9 17	2294	Run of Mine	101	307.40	116	116 tons R. of M. @ \$2.65	.1340
10 15	2542	Lump & Nut	103	344.15	131	6 tons Lump @ 2.75 113 tons Lump & Nut @ \$2.65 12 tons slack @ \$2.35	.1354
18 19	2475	Nut	112	356.25	139	18 tons Run of Mine @ \$2.65 121 tons Nut @ \$2.55,	.1439

STEAMER "CADILLAC"

STATEMENT SHOWING TIME DISCHARGING ORE CARGOES.

NO. CARGOES	NAME OF DOCK	AV. TIME AT DOCK.		AV. TIME AT DOCK DISCHARGING		AV. TIME ACTUALLY AT WORK	
		DAYS	HOURS	DAYS	HOURS	DAYS	HOURS
1	C H & D R'y, Toledo, O.	2	4	2	2	.	13
2	Minnesota, Ashtabula, O.	2	5	1	4		15
2	P Y & A R'y, Ashtabula, O.	2	11	1	14		21
4	C T & Valley, Cleveland, O.	2	8	1	10		19
1	N Y P & O, Cleveland, O.	3	13	2	7		19
7	C & P R'y, Cleveland, O.	2	11	1	13		18
2	P & L E, Fairport, O.	1	2	1			22
3	C L & W R'y, Lorain, O.	1	20	1	10		13
1	Carnegie, Erie, Pa.	1	--		23		9
1	Buffalo Fce.Co. Buffalo, N.Y.	6	19	2	18		20
24	Grand Average,	2	9	1	13		17

C a d i l l a c

GENERAL DATA

Total number of crew (including Master and Engineer).....	16
Length over all,.....	244 feet,
"    Keel,.....	230 "
"    Beam,.....	37 "
Depth,.....	19 "
Net tonnage,.....	1,068 tons
Gross tonnage,.....	1,263 "
Ore capacity,.....	2,327 "
Coal capacity,.....	2,053 "
Engines,.....	15,25,42 X 36
Boilers,.....	1 boiler, 11'6" X 13'
Steam,.....	160
Horse Power,.....	550
Pitch of Wheel,.....	10'9"
Average number of revolutions of wheel per minute, loaded,..	80
"    "    "    "    "    "    "    "    "    "    light,...	87
Number of hatches,.....	( 6 working hatches, ( 5 intermediate hatches
Average miles per hour, light,.....	10.99
"    "    "    "    Loaded,.....	10.00

ANNUAL REPORT  
of  
STEAMER CHOCTAW  
1900



## C h o c t a w

### GENERAL OPERATIONS:

The Choctaw sailed from the port of Lorain, Ohio, on her first trip, April 25, 1900, and arrived at Lorain on her last trip, ready to lay up, October 31, 1900, having been in commission 190 days.

This steamer made 19 round trips, bringing down 14 cargoes of iron ore and 5 cargoes of wheat. Altogether 6 cargoes of coal were carried on up trips during the season. The total number of miles traveled by this vessel for the season was 26,041. She carried 63,736 gross tons of freight, from which the net earnings were \$21,651.18.

The average rate of freight obtained on all commodities of freight carried was \$.8836 per gross ton. The cost of carrying 63,736 gross tons of freight was \$.5439, leaving the net earnings per gross ton \$.3397. It will be noted that the cost to carry shows to be \$.0401 per ton on the Choctaw than on the Andaste, a sister ship. This is principally due to the Choctaw's having been in commission 35 days less than the Andaste, consequently having fewer days over which to prorate fixed charges.

### GENERAL REPAIRS:

The steamer Choctaw only came into the possession of The Cleveland-Cliff Iron Company at the close of the season of 1899 by purchase from The Lake Superior Iron Company. While no particularly large items of repair were made, the steamer was found to be in a somewhat neglected condition, and many things had to be given attention, either in the way of repair or renewal. The aggregate of the General Repair account of \$1,215.46 and the Fitting Out account of \$2,759.28, in which account is included many items of repair, makes a total of \$3,975.74.

While it is not expected that nearly so large an expenditure will be necessary for the coming year, there still remains something to be done in the way of minor repairs of a varied character, before the vessel is ready for sea next season.

### ACCIDENTS:

Collision with Pier at "See": On the evening of April 29th, about 6 o'clock the Choctaw, bound down, ore laden, arrived at the entrance of the Canal leading to the locks on the American side. Her head-way had been stopped and she was drifting in, when a current, caused by the filling of the lock, started her ahead. To overcome this, her engines were backed, which slewed her stern around to port and her bow to starboard, causing her bow to come into collision with the south pier just below the entrance to the

C h o c t a w

canal, breaking several frames, injuring several plates and doing some other damage. The cost of repairing this damage was \$1,098.36, and claim for this amount has been sent to our underwriters.

"City of Erie" and "Mineral State" collision, June 28th, 1900. About 9:30 a.m. on this date, the Choctaw, proceeding up the Cuyahoga River in tow of the tug "Alva B" had reached a point below the Lake Shore Bridge. At this point, the Captain of the Choctaw saw the steamer "City of Erie" coming down to go out, and knew that he would have to get out of her way; the Choctaw, therefore, was kept over to the west pier as closely as possible. When the City of Erie got close to the Choctaw, the tug pulled the Choctaw's bow close over to the pier and the Choctaw's engine was at the same time backed, thus straightening her out and giving the City of Erie all the room there was, and she did pass our steamer allright. It seemed, however that the City of Erie, seeing the bow of the Choctaw first deflected from the tug, was afraid she was going to take a sheer for the Erie, and consequently he pulled over to the starboard side. In so doing, the City of Erie came into collision with the little schooner Mineral State, which was lying alongside the dock on the opposite side from the Choctaw. The damage done to the Mineral State amounted to \$429.96, and this the City of Erie had to pay. They, however, through their attorneys, Messrs. Goulder, Holding and Masten endeavored to place the responsibility of the collision on the Choctaw and sent us a claim for the above amount, which claim they pressed from time to time, the last time being several months since. I told them that after relating the circumstances as above, we had nothing further to say, and referred them to Mr Kelley. Mr Kelley undertook to show them that they could not claim anything from us as the Choctaw had not touched the City of Erie at all, and that it was hardly a proper ground for them to base their claim on, namely what they thought the Choctaw might be going to do. They finally dropped their claim against us.

Grounding, Cuyahoga River, July 5, 1900. At about 8:30 a.m. on this date, the Choctaw was proceeding up the Cuyahoga River in tow of the tug "Harris". A dredge was at work in the river about 75 feet beyond the abutment of the bridge, and had unintentionally piled up mud and dirt for a short distance away from the bank and out into the channel of the river. The Choctaw, on going through the starboard draw of the bridge, stranded on this. The cost of her release was \$107.25, and claim for this amount has been sent to our underwriters.

Choctaw

Grounding above Big Point, St. Mary's River, May 25, 1900. On this night, on account of forest fires, the air was very smoky, and the Choctaw was proceeding under check. When she was about to make the turn at Big Point, the smoke shut in somewhat thicker, momentarily shutting out the ranges from sight. The vessel, however, was hauled up on what was supposed to be her course above Big Point, but the course proved to be somewhat too far to westward, and she ran aground about a mile and a quarter below Point aux Pines. The vessel was released on the morning of the 28th with the aid of tugs, after lightering considerable of her cargo. The claim, amounting to \$3,074.91, has been forwarded to the underwriters.

Collision with Edward Smith, August 24th: In making the dock at Escanaba on this date, the Choctaw struck the wooden steamer Edward Smith, damaging the rail of the Smith to the extent of \$13.48, which we have paid.

Collision with Canal Boat, Chicago River, September 29th: While coming down the Chicago River on the night of September 29th in tow of a tug, the Choctaw took a sheer, and the tug was unable to straighten her up. Before she could recover herself, she struck a canal boat belonging to the Illinois Stone Company, slightly damaging her rail. Nothing has been heard relative to this, and it is not expected that any claim will be made.

Stranding, Maumee River, October 20th. At about 11 pm. of this day the Choctaw arrived at the mouth of the Maumee River and was taken in tow there by the tug Christian. After proceeding a short distance, partly under her own steam, she grounded. the tug Butler was called to her assistance, but the two tugs were unable to release her. On the next morning, the tug Christian returned to the Choctaw, bringing with her the tug Burkhead, and these two tugs finally succeeded in releasing her. She then proceeded up the river in tow of the Christian until past the crib, where she grounded again about 11 am., and this time on a bank said to have been caused by the grounding of another steamer a few days previously. On the evening of the same day, the two tugs pulled again on the Choctaw, but were unable to release her. On the morning of the 22d, three tugs of Sullivan's Tug Line came out, and after pulling about thirty minutes, succeeded in getting her off. The cost of this pulling was \$313.25, which claim has been sent to the underwriters.

Damage to Rock Island Dock, and Breaking the Lines of Steamer Neff: On October 26th, the Choctaw, in tow of the tug Dickerson was coming down the Chicago River. When near the Rock Island Dock, the steamer took a sheer to starboard, and tug pulling on her to

## C h o c t a w

straighten her up, parted the tow-line. The Choctaw's engine was immediately backed, but she struck the dock, breaking one pile and damaging some plank, and also crowded against the "Neff" which was loading lumber at the dock. The force from the Choctaw caused the water to surge up between the Neff and the dock, causing the lines of the Neff to part. We have paid the Chicago, Rock Island & Pacific R'y Company \$25.00 on account of damage to their dock, and the same amount to the Neff on account of damage to her lines

Damage to Canal Street Bridge, Chicago, October 26th. After her collision with the Rock Island Dock, as above, the Choctaw proceeded on down the river, in tow of the tug Dickerson. The vessel came through the left hand draw of the bridge next above the Canal street Bridge, and the swift current which sets up there caught her port bow and set the Choctaw over to the starboard bank above the Canal street Bridge. The tug in the meantime pulled off to port, endeavoring to straighten the vessel up. The Choctaw's engines were worked occasionally to give her steerage way. The river between the Canal street bridge and the one next above it, curves somewhat, the concave side being the starboard side going down. The Choctaw was lying in a diagonal position, her head being toward the port side of the Canal street bridge. The tug waited until the Choctaw's bow was pretty close up to the draw before pulling off to starboard to straighten her up again. In the meantime, it was seen that the current was catching her on the starboard bow and swinging her toward the abutment on the port side of the draw. The Choctaw's engines were immediately backed, in order to check her headway, and at the same time if possible cut her stern to port and her bow to starboard. The tug pulled off to starboard and blew to the Choctaw to back, but her engines were already backing wide open. Notwithstanding the fact that the engines were backed and the tug continued to pull off to starboard, the Choctaw's bow was carried over by the current and came into collision with the upper abutment on the port side. A claim has been rendered by the City of Chicago against the Choctaw for \$5,267.25, and the defence of this claim is in the hands of J M Duffy, Esq., of Chicago, representing us.

Collision with dock at Fairport: On October 29th, while going up the river at Fairport, the Choctaw took a sheer for the dock. The mate sang out to the tug Annie to pull her head over, but the tug did not respond in time. The Choctaw's bow being low, it went under the stringer of the dock and brought up on the port forward timberhead, cracking a plate. It will cost about \$15 or \$20 to repair this.

## C h o c t a w

Collision of the steamer Alfred Mitchell with the Choctaw, Harbor of Gladstone, July 27th.

This accident was one in which the Choctaw had no part, but as a matter of record, an account of same is appended below:

The Choctaw had arrived at Gladstone on the preceding day, viz. July 26th, and was unloading a coal cargo; the boat was lying at the Pioneer Fuel Company's dock. On the evening of the 27th, about 8:30 o'clock, the steamer Alfred Mitchell was coming into port very slowly, heading almost straight for the Choctaw, intending to line up alongside of her at the dock. When about a thousand feet from her, or near the black stake, they shut off the Mitchell's engine, and she was drifting in with what headway she had. Her engines had been previously backed to stop her headway, but when she got to within about two hundred feet of the Choctaw, the signal was given to the Mitchell's engine for the final back, which would throw her stern around to port, and just about bring her alongside of the dock nicely. However, her engine, which is a compound, set on opposite centers, apparently got on the centers, and the engine did not act. The people on the Mitchell threw their anchor overboard, and did everything possible to stop their boat, but she kept coming on slowly, and it was impossible to stop such headway as she had, and she struck the Choctaw abreast of hatch number 3 on the starboard side, damaging plates, breaking one stringer and bending the other, also breaking both wale-strakes. The Choctaw loaded a light load and proceeded to Lake Erie, where after being discharged she was repaired at the yards of The American Ship Building Company. A claim for the cost of these repairs, including a claim for demurrage of \$ 958.80, was sent to the owners of the Mitchell, and the same was paid.

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C h o c t a w

	1 8 9 9		1 9 0 0	
	Days	Percent	Days	Percent
Time in port,.....			76	40.0
Time Sailing,.....			97-1/2	51.3
Time lost by bad weather,.....			3	1.6
Time lost waiting at See Canal and River,.....			1/2	.3
Time lost by accidents,.....			13	6.8
Total Time in Commission,.....	222		190	100.0
Number of trips made,.....		28		19
Number of cargoes carried,.....		30		25

C h o c t a w

<u>R e c e i p t s</u>	GrossTons	Amount	Per gross ton Freight Carried.
5 cargoes iron ore from Marquette,.....	14,116	\$15,527.60	\$1.10
9 " " " Escanaba,.....	24,972	24,972.00	1.00
1 " wheat from So.Chicago (90,000 bus. at 2-1/8¢).	2,410	1,912.50	.7937
4 " " " Chicago (370,565 " avg.rate.0187)	9,926	6,940.75	.6993
2 " coal to Marquette (3828 net tons at 50¢).....	3,417	1,913.95	.5600
3 " " " Milwaukee (2425 " " " 65¢)			
1 " " " Gladstone (2557 " " " 40¢).....	2,283	1,023.02	.4481
Amount received from owners of Str. Alfred Mitchell, demurrage on account of collision,.....		958.80	
<b>25 cargoes, Totals,</b>	<b>63,736</b>	<b>\$56,318.98</b>	<b>\$.8836</b>
<u>D i s b u r s e m e n t s</u>			
Extraordinary and General Repairs,.....	\$ 1,216.46		
Ship Keeping and Winter Dockage,.....	2,759.28		
Fitting Out,.....	6,870.91		
Wages and Captain's Salary,.....	60.39		
Captain's Expense Account,.....	1,202.28		
Tug Services,.....	10,690.25		
Handling Cargoes,.....	180.00		
Cargo Commissions,.....	289.00		
Taxes,.....	3,556.01		
Marine Insurance,.....	39.75		
Freight List Insurance,.....	232.23		
Mate's Supplies,.....	1,202.68		
Provisions,.....	189.68		
Steward's Supplies,.....	5,297.11		
Fuel,.....	136.64		
Engineer's Lubricants,.....	39.15		
Engineer's Supplies,.....	16.70		
Boiler Repairs,.....	25.52		
Machinery Repairs,.....	6.13		
Auxiliary Engine Repairs,.....	183.48		
General Expense (Telegrams,Dues,Lake Carriers Assn etc)	474.15	\$34,667.80	\$.5439
Laying Up,.....			
<b>Net Earnings,</b>		<b>\$21,651.18</b>	<b>\$.3397</b>
Deduct amount paid account shortage of grain cargo,....	229.01		
Less amount received " overrun of grain cargo,.....	1.60	227.41	
		\$21,423.77	
Less amount not allowed by insurance Companies in adjustment of claims,.....		528.48	
<b>Making total net gain for season 1900,.....</b>		<b>\$20,895.29</b>	

C h o c t a w

	1 9 0 0
Days in Commission,.....	190
Number of miles traveled,.....	26,041
Number of trips made,.....	19
Number of cargoes carried,.....	25
Gross tons freight carried,.....	63,736
Average rate freight per gross ton, .....	\$ .8836
Average cost to carry per gross ton freight, .....	.5439
Net Earnings per ton freight carried,.....	\$ .3397
Gross Receipts,.....	\$ 56,318.98
Gross Expenditures,.....	34,667.80
Net Earnings,.....	\$ 21,651.18
Percentage of Operations to Earnings,.....	61.5
Gross Earnings per mile traveled,.....	\$ 2.1627
Operating Expenses per mile traveled,.....	1.3313
Net Earnings per mile traveled,.....	\$ .8314
Gross Earnings per day,.....	\$ 296.41
Operating Expenses per day,.....	182.46
Net Earnings per day,.....	\$ 113.95
Expenses per day excluding cargo handling costs,.....	\$ 126.19
Cost provisions per man per day (excluding extra meals).....	\$ .340
Average tons coal consumed per mile steamed,.....	<u>156</u> 2000
Average cost coal consumed per mile steamed,.....	\$ .2034
Average tons coal consumed per hour steamed,.....	<u>1736</u> 2000
Average cost oil consumed per hour steamed,.....	\$ .0584
Average cost oil consumed per mile steamed,.....	\$ .00525
Average wages paid per day while in commission,.....	\$ 30.21
Average ore cargo from Lake Superior,.....	2823
Average draft of water on ore cargoes from Lake Superior,.....	17'1" for'd, 17'8" aft.



"CHOCTAW"

DETAILS OF PROVISION ACCOUNT.

	1900		
	QUANTITY	AVG. PRICE	AMOUNT
Sugar	1027 lbs.	\$.056	\$58.37
Tea	33 "	.35	11.55
Coffee	174 "	.125	22.16
Spices and vinegar			10.40
Extracts	27 btls.	.283	7.65
Baking powder,	31 lbs.	.147	5.57
Bread and crackers,			9.92
Butter and butterine,	437 lbs.	.189	81.73
Lard and cottolene	232 "	.095	22.00
Cheese	50 "	.143	7.17
Fresh milk	310 gal.	.196	60.89
Condensed Milk	45 cans	.096	4.39
Pickles,			5.84
Sauces			7.57
Eggs	292 doz.	.153	44.73
Flour	11 bbls.	4.22	46.34
Buckwheat, Graham & Cornmeal,	170 lbs.	.021	3.75
Farinaceous foods,	208 lbs.	.044	9.14
Canned fruits,	122 cans	.106	12.89
Canned vegetables,	107 cans	.084	9.07
Dried fruits	180 lbs.	.099	17.82
Dried vegetables,	109 lbs.	.05	5.45
Fresh fruits,			38.21
Fresh vegetables,			68.64
Potatoes,	114 Bu.	.532	60.65
Dried Onions,	17 pks.	.331	5.63
Fresh fish,	214 lbs.	.082	17.60
Salt fish,	21 lbs.	.111	2.47
Fresh meat,	3972 "	.096	375.29
Salt meat	1214 "	.082	99.56
Molasses & Syrups,	14 gal.	.325	4.56
Ice	517 cwt.	.195	101.00
Miscellaneous,			5.62
			\$1243.63
Credit ("ALFRED MITCHELL")			40.95
TOTAL,			\$1202.68

Average consumption of meat per man per day was 1.44 lbs.

"CHOCTAW"

DETAILS OF STWARD'S SUPPLIES ACCOUNT.

	<u>1900</u>
Bed Linen, blankets, etc.	\$156.35
Cutlery, spoons, etc.	11.66
Crockery and glass,	5.00
Kitchen utensils,	29.67
Soap,	13.04
Scouring material,	11.00
Brooms,	2.77
Brushes,	.75
Laundry	94.78
Range coal,	41.25
Couch, curtains, linoleum, &c.,	7.92
Chairs,	2.00
Sundries,	30.28
TOTAL,	<u>\$406.47</u>

"CHOCTAW"

DETAILS OF MATE'S SUPPLIES ACCOUNT.

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	<u>1900</u>
Canvas, duck, etc.,	\$186.59
Kerosine oil,	70.81
Ropes, etc.	297.66
Hose,	52.00
Lamp chimney and globes,	13.91
Lamps, lanterns and burners,	13.78
Soap,	2.25
Scouring material,	12.16
Rags,	5.11
Hardware and tools,	35.82
Brushes,	9.90
Brooms,	7.17
Candles,	6.75
Sundries,	77.94
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TOTAL	\$791.85

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