INVENTORY IRON CLIFFS CO. - NOV. 30- 1902.

GENERAL SUPPLIES.

1	Plow,	10.00
1	Hoist Cage,	5.00
1	Cart,	5.00
15	Old half wagons,	15.00
21	" " sleighs,	3.50
1	Dump sleigh,	1.25
7b	Coal boxes,	7.00
2	Old land rollers,	6.00
2	Platform Scales,	7.50
1	Wagon "	125.00
1	Blake Crusher 9 x 15,	200.00
1	" " 8 x 15	125.00
1	Bench & Vice,	3.00
1	S-ieve,	.50
2	Scoops,	1.00
1	Wheelbarrow,	.50
1	Horizontal engine 9x 12(scrap)	15.00
2	Crow Bars,	1.00
3	Old Sledges,	1.00
1	Small coal stove,	1.50
1	Burning Brand,	.50
50 ft.	Wire Rope,	6.00
100 ft.	1/8" wire rope,	10.00
62 "	3/4" " "	12.96
1	Circle rip saw,	.50
1	Sand Screen,	2.00
2	L. H. Shovels,	.50
1	Coal Fork,	1.00
1	Lot Shafting & Pulleys,	5.00
	Total fwd.	$ 572.21

	Amt. Bro't. Fwd.	$ 572.21	
1	Cold Air Receiver,	5.00	
1	Coal Basket,	.25	$ 577.46
	- BARN -		
1	Single wagon,	40.00	
1	Top buggy,	20.00	
1	Open "	10.00	
1	Cutter,	20.00	
1	Single harness,	10.00	
2	" work "	21.00	
2	Forks,	.50	
1	Cross cut saw,	3.75	
1	Wheelbarrow,	.50	
1	Buffalo robe,	25.00	
2	Horse blankets,	3.75	
1	Grinding Stone,	.50	
1	Pump,	1.00	
1	Set Bells,	.50	
1	Tie strap,	.60	
1	Driving horse,	10.00	
1	Truck wagon,	15.00	
1	Cart,	5.00	
1	Lap robe,	2.50	
1	Whip,	1.00	
1	Blanket,	4.00	
1	Pail,	.50	
1	Set sleighs,	32.00	$ 227.10
			$ 804.56
	Less 80 %		643.65
			$ 160.91
	"WAREHOUSE"		
250	Pcs. 2 1/2 x 5 1/2x 13(New fire brick)	5.00	
320	" 3x3x4x9- @ 8.00 (Old " ")	2.56	
300	" 2x2x9 " " " "	2.40	
		$9.96	

	Amt. Bro't. Fwd.	$ 9.96	$ 160.91
800	Pcs. 2 1/2 x3x4x9(New fire brick) @ $20,	16.00	
400	" 3x4x9 (Old " ") @ $8,	3.20	
19	" 3x4x14 Saw Pattern Lumber,	2.48	
12	" " " " "	1.68	
30	" 3x3x12 Hardwood "	2.70	
1	Excentric Crusher shaft, finished,	15.00	
3	" " " rough,	15.00	
1	Pc. steel shafting 3c30 "	.50	
2	Kegs lath nails @ 1.50	3.00	
16	" 6d. " " " "	24.00	
16"	Striking Hammer,	1.60	
1	Bone Mill,	250.00	
3910#	Crusher Castings @ 1/4 ¢	9.77	
3200#	" " " 1/4 ¢	8.00	
195#	Steel Sledges,	19.50	
		$ 382.39	
	Less 50 %	191.20	
			191.19
	Total- General Supplies,		$ 352.10

INVENTORY I. C. Co. - NOV.- 1902.

Greenhouse Supplies.

Plants in Solid Beds.

No.	Name.			Amount.	
225	Smilax	@	.05	$ 11.25	
90	Asparagus pluniosa,	"	.10	9.00	
25	Adiantum Cuniatum,	"	.08	2.00	
80	Pteris Treinula,	"	.08	6.40	
12	" serulata,	"	.05	.60	
50	Lycopodium,	"	.02	1.00	
50	Tradescanthia,	"	.02	1.00	
5	English Ivys,	"	.10	.50	
570	Violets plants,	"	.05	28.50	
2156	Carnations	"	.08	172.48	
500	Tea Roses,	"	.10	50.00	
132	American Beauty Roses,	"	.20	26.40	
3000	Pansy plants,	"	.01	30.00	
3	Plumbagos,	"	.05	.15	
1	Alamauda,	"	.2 5	.25	
150	Chrysanthemums,	"	.05	7.50	
1	Calla,	"	.15	.15	
32	Swansonia,	"	.10	3.20	
25	Sweet Alysum,	"	.01	.25	
		Total,			350.63

BULBS IN FLATS.

1000	Roman Hyacinths,	@	.02	20.00	
300	Dutch "	"	.04	12.00	
700	Double Narcissus,	"	.02	14.00	
300	Single Tulips,	"	.02	6.00	
		Total,			52.00

BULBS IN POTS.

200	Lilium Harrisii,	@	.15	30.00	
200	" Longiflorum,	"	.15	30.00	
100	Dutch Hyacinths	"	.07	7.00	
		Total fwd.		$67.00	$ 402.63

		Amt. Bro't. Fwd.		$ 67.00	$ 402.63
12	Single Tulips,	@	.02	.24	
12	Double Narcissus,	"	.02	.24	
		Total- Bulbs in pots,			67.48
	DRY TUBERS.				
300	Cannas,	@	.08	24.00	
150	Double dahlias,	"	.05	7.50	31.50
	PLANTS IN POTS.				
11	Geraniums-Myrtle	@	.20	2.20	
21	Azealia	"	.50	10.50	
61	Primula Chinesis	"	.05	3.05	
10	" Forbesi,	"	.01	.10	
8	" obconica	"	.02	.16	
190	Cinneraris-hybodia	"	.05	9.50	
6	Swanzonia	"	.05	.30	
18	Heliotropes	"	.05	.90	
12	Amerillis Vallota	"	.03	.36	
36	English Polargonium	"	.10	3.60	
12	Stevea Floribunda	"	.05	.60	
100	Altheauthera	"	.01	10.00	
7	Acheranthus	"	.02	.14	
150	Vinca Varigate	"	.08	12.00	
1	Orange	"	.25	.25	
24	Geranium Ivy,	"	.01	.24	
50	English "	"	.05	2.50	
25	Forgetmenot	"	.01	.25	
6	Abutilor	"	.10	.60	
8	Genista	"	.05	.40	
6	Paris Dasies	"	.02	.12	
75	Caceolarias	"	.03	2.25	
50	Begonias asst'd.	"	.05	2.50	
6	Salvia splendeas	"	.10	.60	
2	Aurucaria Excelsior	"	2.50	5.00	
		Totals forward,		$ 68.12	$ 501.61

		Amt. Bro't. Fwd.		$ 68.12	$ 501.61
2600	Geranium souala	@	.02	52.00	
230	" "	"	.05	11.50	
14	" Mt. of snow,	"	.05	.70	
12	" Roseleaf	"	.05	.60	
8	" Ivy	"	.05	.40	
100	" "	"	.02	2.00	
500	" Mad. Saleroy	"	1/2 ¢	2.50	
15	Lobelia	"	.01	.15	
136	Petunia	"	1 1/2 ¢	2.04	
14	Acheveria	"	.01	.14	
5	Cactus truncatum	"	.02	.10	
45	Mignonette	"	.02	.90	
95	Callas,	"	.01	.95	
8	Cyclomen	"	.05	.40	
45	Lantauas asst.	"	.03	1.35	
29	Fuchsias	"	.04	1.16	
16	Hydrangea	"	.05	.80	
1	Grevilla robusta	"	.15	.15	
75	Colens asst'd.	"	.04	3.00	
6	Orchids	"	.50	3.00	
52	Tea Roses,	"	.05	2.60	
12	Hybrid Roses,	"	.15	1.80	
2	Sansiveria	"	.10	.20	
7	Authericum	"	.05	.35	
8	Cypress papyrus	"	.10	.80	
2	Hoga	"	.20	.40	
8	Curculigo	"	.05	.40	
6	"	"	.10	.60	
20	Aspidtra	"	.20	4.00	
2	Draceanaindivisa	"	.75	1.50	
10	" "	"	.25	2.50	
2	" terminalis	"	.20	.40	
		Totals forward,		$ 167.51	$501.61

	Amt. Bro't. Fwd.		$	167.51	$501.61
2	Draceana indivisa(Terms.)@	.35		.70	
2	" fragrus "	.40		.80	
2	Marautha zebrina "	.25		.50	
3	Ficus clestica "	.75		2.25	
4	" " "	.50		2.00	
48	Asparagus plumosa "	.10		4.80	
59	" syringerii "	.10		5.90	
10	Pteris Tremula "	.05		.50	
13	" " "	.15		1.95	
19	" serulata "	.05		.95	
35	Boston Ferns "	.15		5.25	
7	" " "	.20		1.40	
7	" " "	.25		1.75	
16	Kentia Belmoreaua "	.50		8.00	
10	" " "	.65		6.50	
9	" " "	.75		6.75	
3	" " "	1.50		4.50	
2	" Fosteriana "	3.00		6.00	
2	Areca lutesceus "	.50		1.00	
4	" " "	2.50		10.00	
3	" " "	3.00		9.00	
2	Pandanus utilies "	3.00		6.00	
7	Lantania borbonica "	.60		4.20	
2	" " "	.75		1.50	
1	" " "	2.00		2.00	
1	Phoenix dactilifera "	.50		.50	
1	" " "	.75		.75	
2	" " "	1.00		2.00	
3	" " "	1.50		4.50	
4	" filifera "	2.00		8.00	
2	Cycas revoluta "	3.00		6.00	
1	" " "	1.00		1.00	
50	Bourvardias "	.05		2.50	
	Total plants in pots,				286.96
	Total forward,				$ 788.57

		Amt. Bro't. Fwd.		$ 788.57
175	Callas @ 15 ¢ (In solid beds),			26.25

FLORIST SUPPLIES.

WIRE DESIGNS.

6	Flat Wreaths	8"	.21	
3	" "	6"	.06	
3	" "	10"	.17	
18	" "	12"	1.35	
2	" "	14"	.18	
8	" "	18"	1.12	
3	" "	20"	.45	
6	Wreaths on stand	12"	1.02	
6	" " "	14"	1.50	
6	Flat hearts	8"	.24	
6	" "	10"	.30	
5	" " 12"	12"	.35	
5	" "	14"	.45	
5	" Crescents	12"	.45	
4	" "	18"	.80	
4	Horse shoes on stand	12"	.44	
4	" " " "	18"	.80	
1	Slanting Cross	18"	.40	
6	Flat Crosses	8"	.15	
7	" "	12"	.28	
13	" "	14"	.65	
5	" "	18"	.40	
4	" "	.20"	.40	
5	" "	22"	.45	
3	" "	24"	.36	
6	" on stand	16"	1.08	
6	" " "	18"	1.14	
6	" " "	24"	1.50	
		Totals forward,	$ 16.70	$ 814.82

		Amt. Bro't. Fwd.	$ 16.70	$ 814.82
8	Stars- flat	6"	.48	
4	" "	8"	.32	
1	" on stand	16"	.45	
10	Anchors- flat	12"	1.00	
4	" "	18"	.64	
2	" "	22"	.40	
4	" "	24"	.92	
1	" on stand	18"	.22	
2	" " "	22"	.60	
5	Crosses- Maltesi	14"	.65	
1	" "	16"	.16	
1	" "	8"	.03	
5	" " "	30"	1.75	
6	Pillows	10"	.42	
3	"	12"	.30	
10	"	14"	1.40	
11	"	16"	1.87	
11	"	18"	2.20	
6	"	20"	1.50	
3	"	24"	.90	
2	Sickles	16"	.22	
2	"	18"	.30	
3	Fourleaf Clover	12"	.90	
2	Lyre on base	20"	.80	
1	" " "	24"	.65	
2	" " "	.28"	1.50	
1	" " "	34"	.85	
1	Harp on base	20"	.30	
2	" " "	30"	1.00	
2	Stars & Crescents on base	18"	1.20	
1	" " " "	20"	.80	
			$ 41.43	
		Total forward,		$814.82

	Amt. Bro't. Fwd.		$ 41.43	$ 814.82
2	Broken Columns	18"	.80	
2	" "	24"	.50	
1	Gates Ajar	22"	1.00	
1	" "	24"	1.20	
1	Marriage Bell	18"	.75	
1	Fireman's Hat- regular size,		.55	
2	Scrolls	20"	.90	
1	"	24"	.65	
2	Bibles	20"	.80	
1	Yoke	24"	.50	
1	Oddfellow's Emblem	14"	.50	
1	" Link	18"	.30	
1	G.A.R. Badge	24"	1.00	
1	Shield	14"	.15	
1	Fan	12"	.10	
1	Epworth League Emblem	22"	.50	
1	Cross of St. Andrews	24"	.25	
1	Elk's head on base	30"	1.50	
1	Masonic Emblem in wreath	20"	.50	
1	" " " "		.25	
1	Mistic Shrine Emblem	24"	1.00	
1	K. of P. "	24"	1.25	
1	Rock of Ages with cross	36"	1.25	
1	Keystone	16"	.15	
1	Set of Fireman's Axes	24"	.50	
2	Knapsacks- Army size,		1.30	
2	Knight Templar's Emblem	24"	1.00	
7	Hanging Baskets	10"	1.00	
4	" "	12"	.68	
9	Fancy Willow Baskets,		3.55	
2	Willow Trays,		$ .50	
	Totals forward,		$ 66.31	$814.82

	Amt. Bro't. Fwd.			$16.65	$ 939.60
12	Stapelia Pinata	@	.05	.60	
70	Rhamnus fraugala	"	.05	3.50	
70	Philadelphus corouarius	"	.15	10.50	
375	Berberis Thunbergia	"	.05	18.75	
750	Amorpha frutesceus	"	.05	37.50	
230	Spirea calosa alba	"	.05	11.50	
225	" Bumalda	"	.05	11.25	
430	" Apulifolia	"	.05	21.50	
250	Philadelphus grandfl	"	.05	12.50	
80	" Zeherii	"	.05	4.00	
130	Ribis gordoniensis	"	.05	6.50	
60	Pottentilla fructiusa	"	.05	3.00	
400	Ceanothus americanus	"	.05	20.00	
425	Syringa Vulgaris	"	.05	21.25	
75	Syringa fancy Asst'd.	"	.12	9.00	
390	Corylus avellana	"	.05	19.50	
50	Forsythia virvidisina	"	.05	2.50	
175	Syringa Meuteusis	"	.05	8.75	
340	" Sangeua alba	"	.05	17.00	
125	Corchorus pleao	"	.05	6.25	
350	Viburnum Florapleau	"	.08	28.00	
530	Cornus sibirica	"	.05	26.50	
575	" stolonifora	"	.05	28.75	
3900	Symphoricarpus rubra	"	.04	156.00	
800	" alba	"	.04	32.00	
8	Callycanthus(spice shrub)	"	.10	.80	
	Total ,				534.05
	HARDY PERENNIALS.				
65	Phlox decusata	@	.10	6.50	
58	Hollyhock	"	.10	5.80	
18	Iris Kempherii	"	.10	1.80	
7	Digtamus	"	.10	.70	
	Totals forward,			$ 14.80	$1473.65

	Amt. Bro't Fwd.			$ 14.80	$1473.65
8	Funkia Vudulata	@	.10	.80	
55	Aquilegia	"	.05	2.75	
40	Eulalia Japonica asst'd.	"	.10	4.00	
200	Peonies chineusis asst'd	"	11 1/2 ¢	23.00	
5	Delphinum,	"	.05	.25	
25	Coreapsis	"	.05	1.25	
2	Gailardia picta	"	.10	.20	
12	Achillia perle	"	.05	.60	
4	Peonies	"	.25	1.00	
	Total-Hardy Perennials,				48.65

SUPPLIES, TOOLS, FIXTURES, ETC.

100	Lettice Shades,			1.00	
450 lbs.	Burlap	@	3 1/2 ¢	15.75	
3	Pointed shovels,			1.65	
1	Garden rake,			2.25	
1	" line,			.75	
1	Automatic sprinkler,			.75	
90 ft.	black iron pipe	1 1/2 in.	@ .10	9.00	
54 "	galv. " "	3/4 "	" .05	2.70	
9	Brass stopcocks,		" .25	2.25	
	Total- Sup. Etc,				36.10
	Total- Nursery,				$1558.40

INVENTORY I. C. Co. - Nov. 30th. 1902.

BELLEVUE FARM SUPPLIES.

LIVE Stock.

1	Cow	"Bess",	$ 65.00
1	"	"Pride"	50.00
1	"	"Topsy"	55.00
1	"	"Susie"	45.00
1	"	"Lucy"	45.00
1	"	"Flora"	70.00
1	"	"Floss"	70.00
1	"	"Golden Lue"	65.00
1	"	"Golden Elsie"	65.00
1	"	"Mary"	65.00
1	"	"Blossom"	50.00
1	"	"Dot"	45.00
1	"	"Maggie"	50.00
1	"	"Maltise"	55.00
1	"	"Roan"	60.00
1	"	"Pearl"	60.00
1	"	"Brindle"	60.00
1	"	"Van"	55.00
1	"	"Jumbo"	60.00
1	"	"Goldie"	60.00
1	"	"Olive"	60.00
1	"	"Nig"	55.00
1	"	"Jennie"	60.00
1	"	"Spot"	55.00
1	"	"Doll"	55.00
1	"	Cherry"	60.00
1	"	"Polly"	60.00
1	"	"Nancy"	50.00
1	"	"Fairy"	60.00
		Total forward,	$1665.00

	Amt. Bro't. Fwd.	$1665.00
1	Cow "Rose"	50.00
1	" "Clara"	65.00
1	" "Reddie"	45.00
1	" "Blanch"	50.00
1	" "Sally"	60.00
1	" "Maud"	50.00
1	" "Devon"	55.00
1	" "May"	55.00
1	" "Daisy"	45.00
1	" "Buttercup"	45.00
1	Bull "Duke of Iroquois" #157494,	125.00
1	Heifer "Nora" 2 yrs.	35.00
1	" "Smut" 2 "	35.00
1	Steer "Tom" 2 "	30.00
1	Jersey calf 1 "	25.00
2	" " 6 mo. @ 15.00	30.00
9	Calves under 6 " " 10.00	90.00
10	" over 6 " " 15.00	150.00
5	" 1 yr. and over " 20.00	100.00
27	Sheep for market @ $4	108.00
69	"- grade (Shropshire) @ $8,	552.00
20	" " (Merino) " $6,	120.00
21	Lambs for market " $4,	84.00
49	Angora goats " $8.50,	416.50
1	" buck,	50.00
12	Lambs(breeding), " $5.50	66.00
4	Shropshire Rams, " $10.00	40.00
1	Team- (Prince & Lady)	300.00
1	" (Bert & Bird)	350.00
1	Poland China Sow, "Modle Pride"	20.00
1	" " " "Cliffs Pride"	20.00
5	Brood Sows @ $15,	75.00
	Total forward,	$5006.50

	Amt. Bro't. Fwd.	$5006.50	
26	Porkers @ $7,	182.00	
1	Poland China Boar "Jim Green",	20.00	
660#	Sheep wool @ 20 ¢	132.00	
1	Turkey Gobbler,	2.50	
5	" hens, @ $1.25,	6.25	
5	" " (market)1.00	5.00	
1	Plymouth Rock,rooster-	2.00	
65	" " hens @ 75 ¢,	48.75	
1	Drake,	1.00	
1	Duck,	1.00	
1	Shepherd dog "Rose",	7.15	
	Total Live Stock,		$5414.15

DAIRY SUPPLIES.

1-	8 H. P. boiler complete.		
1-	6 " " upright engine.		
1-	50 gal. cream vat.		
1-	60 " churn complete.		
1-	#2 baby cream separator.		
1-	8 Bottle Babcock Tester.		
1-	Port. galv. wash sink.		
1-	#0 Mason butter worker.		
20ft.	5"-4 ply rubber belting.		
50"	2"-2 " " "		
31"	1 11/16 shafting.		
4	1 11/16 A. D. Hangers.		
2	1 11/16 Collars.		
1	5x20- 1 11/16 W.S. Pulley.		
2	4x5 " " "		
1	4x4 " " "		
1	1 11/16 Coupling.	Total, $457.16	
	Total forward,		$5414.15

	Amt. Bro't. Fwd.	$ 457.16	$5414.15
DAIRY SUPPLIES CON'D.			
8-	8 gal. Elgin milk cans,	16.00	
4-	10 " " " "	12.00	
1-	Belt punch,	.36	
1-	" awl- Reamer,	.11	
2-	60# milk scales,	12.00	
1-	Robert's better salting scale,	5.50	
46-	1/2 pt. test jars,	4.60	
2-	Tin Test Measures,	.10	
1	Box Corrosive test tablets,	1.00	
1-	1# Butter Print,	4.50	
1-	1/2# Gem butter print comp.	9.50	
1-	Carved block for print,	5.00	
2-	Qt. butter color,	1.10	
1-	Dairy table,	7.00	
1-	" "	2.25	
6-	Milk pails @ 90 ¢	5.40	
2-	Corn " " 25 ¢	.50	
1-	Butter box,	5.10	
2-	" bowls,	1.00	
1-	Worm screw & brushing,	4.50	
2-	Milk tubes,	1.80	
1-	" probe,	.75	
1-	Barrel cart,	2.00	
1-	Rotary Pump & Pulley,	16.63	
2-	Rubber maps,	.50	
		$ 576.36	
	Less 50 %	288.18	288.18
	Total forward,		$5702.33

	Amt. Bro't Fwd.		$5702.33
	TOOLS & IMPLEMENTS.		
	" NEW "		
1	Wagon (Lindslay),	37.25	
1	Hay loader "	43.00	
1	" tedder,	30.00	
1	Steel horse rake,	17.00	
1	Sulky Cultivator,	21.00	
1	"Carter" "	3.85	
1	Stump puller,	49.00	
1	Scraper,	6.00	
1	Dehoring machine,	12.50	
1	Incubator & brooder complete,	30.50	
1	Stump hook,	5.00	
		$ 255.10	
	Less 25 %	63.78	
			191.32
	TOOLS & IMPLEMENTS.		
	" OLD "		
1	Acme feed steamer,	25.00	
1	Sheep dipping tank,	14.00	
2	Plows,	21.45	
1	Spr. tooth harrow,	19.25	
1	Horse hay rake,	10.00	
1	Mowing machine,	25.00	
1	" "	45.00	
1	Grinding stone and frame,	1.00	
1	Sheep shearing machine,	12.00	
2	Set heavy work harness,	79.00	
2	Garden rakes,	.40	
1	Hand seeder,	3.00	
1	Disk harrow- complete,	32.00	
1	Pea harvester,	15.00	
1	Wagon scale,	40.71	
	Totals forward,	$ 342.81	$5893.65

VV.

	"OLD" CON'D.	Amt. Bro't. Fwd.	$ 342.81	$5893.65
1	Ideal Deering Binder,		130.00	
1	" Corn Harvester,		125.00	
1	Delivery sleigh,		40.00	
1	Hand Roller,		17.54	
1	Corn Planter,		7.94	
1	Hand Seed Drill,		7.50	
2	Horse cultivators,		6.24	
1	Circular Saw,		23.75	
1	Ensilage cutter,		133.80	
2	Scythes & Snaths	@ 50 ¢	1.00	
3	Scoop shovels,	" 1.25	3.75	
4	Round point "	" .75	3.00	
1	Square " "		.75	
1	Spade,		1.25	
5	Hand hoes,		2.00	
1	Stoneboat,		2.50	
1	Post hole auger,		1.25	
1	Wagon box, neck-yoke & whiffletrees,		8.00	
1	Wagon complete,		64.50	
1	" - delivery,		40.00	
1	Heavy sleigh,		45.00	
1	Shot gun,		8.00	
1	Hose 50ft. 3/4",		7.50	
1	2 in. Auger bit,		.75	
1	1 1/4 " "		.75	
1	1" " "		.50	
3	Set Burrs,		3.00	
1	Monarch feed grinder,		22.00	
2	Hay racks,		3.75	
1	Sickle grinder,		5.00	
		Total,	$1058.83	
		Less 50 %	529.42	
				529.41
		Total forward,		$6423.06

		Amt. Bro't. Fwd.			$6423.06
		FEED.			
80	75	Tons hay	@ $10.00	750.00	
	75	" corn ensilage	" 5.00	375.00	
	22	" straw	" 5.00	110.00	
80	700	Bushel of oats	" 32 ¢	224.00	
			Total,	$1459.00	1459.00
			Total Farm Supplies,		$7882.06

	Miscellaneous.	Amt. Bro't. Fwd. $66.31	$ 814.82
3	Swiss Moss Baskets,	.30	
1	Sheaf of wheat,	.35	
1 1/2	Bunch Immortelle,	.35	
3	Boxes Florist Pins,	1.50	
12	Pot covers,	1.20	
2	Boxes Toothpicks,	.15	
2	Lbs. Bacffea,	.40	
20	" Tinfoil,	2.00	
9	Spools Florist Thread,	1.15	
4	Lbs. Hemp cord,	1.00	
10	" Jute Twine,	1.20	
2	" Sulphur,	.10	
3	" Helebore,	.75	
3	Yd. Immortelle Lettering,	.90	
100	Boston Letters,	2.00	
140	Immortelle "	3.80	
2	Florist Albums,	2.00	
2	Cemetery Vases,	.70	
1	Script Brother,	.28	
1	" Sister,	.26	
1	" Rest,	.16	
200	Tree lables 3 1/2",	1.35	
300	Pot lables 5",	.30	
30	Lbs. Annealed wire,	3.25	
500	Galvanized wire stakes 3'	4.00	
132	" " " 6'	1.50	
1400	ft. Wire netting 18" wide,	10.00	
35	Lbs. #15 galv. wire,	5.25	
300	Florist Redleaf Lables,	1.40	
	Totals forward,	$ 113.91	$ 814.82

		Amt. Bro't. Fwd.	$ 113.91	$ 814.82
4	Glass Vases,		.75	
2	Metal Jardiners,		.50	
1	Stone Jardiner & Pedestal,		1.25	
2	" " "		.70	
1 1/2	Bale Tobacco Stems,		3.00	
1/2	" Moss,		.50	
1	Galbon Mastica,		1.00	
3/4	Box glass 14 x 18		3.45	
1/2	" " 8 x 10		2.30	
4	rolls wrapping paper,		6.00	
5	bundles cane stakes,		3.75	
1/2	Lbs. copper wire,		.35	
1	Box rubber bands,		1.00	
3	Bolts Ribbon,		4.30	
5	Doves,		5.80	
	Tissue paper,		4.00	152.56

FOLDING FLOWER BOXES.

50	3 1/2 x 4 x 8	.75	
25	3 x 5 x 18	.55	
20	3 x 5 x 15	.40	
35	3 x 7 x 18	1.20	
50	3 x 3 1/4 x 6 1/2	.70	
80	5 x 36 x 6	4.60	
75	5 x 24 x 8	3.20	
85	3 x 21 x 7	2.55	
90	3 x 21 x 5	2.10	
75	3 1/2 x 24 x 5	2.79	18.84
	Total forward,		$ 986.22

	Amt. Bro't. Fwd.			$ 986.22
	DESIGN FOLDING BOXES.			
42	7 x 26 x 17		7.56	
45	6 x 24 x 24		6.75	
42	6 x 20 x 20		4.62	
40	6 x 20 x 16		4.00	
47	6 x 15 x 15		3.76	
				26.69
	FLOWER POTS.			
4000	" "	2 " $4.00 per M.	16.00	
1400	" "	3" 6.25 " "	8.75	
1500	" "	4 " 10.00 " "	15.00	
170	" "	5 " 17.75 " "	1.20	
89	" "	6 " 26.60 " "	.24	
54	" "	7" 45.00 " "	2.44	
50	" "	8" 70.50 " "	3.53	
16	SAUCERS.	7" .03	.48	
4	"	6" .02	.08	
9	"	4" 3/4 ¢	.07	
4	HANGING BASKETS.	10"	1.00	
3	" "	12"	1.05	
				49.84
	F U E L.			
25	Cds. wood (sawed)	@ $3.25	81.25	
100	" "	" 2.50	250.00	
89	1350 Tons of coal,		187.71	
		Total,		518.96
	TOOLS & FIXTURES.			
7	Thermometors,		.70	
1	" self registering,		2.50	
2	Scollay sprinklers,		.75	
12	Florist vases,		3.25	
1	Mastica Machine,		1.00	
1	Garden trowel,		.15	
		Totals forward,	$ 8.35	$1581.71

	Amt. Bro't. Fwd.	$ 8.35	$1581.71
1	Lawn shears,	.20	
2	Watering pots,	1.50	
1	Powder bellows,	1.00	
1	Earth sieve,	.25	
1	Sickle,	.25	
1	Spade,	.50	
4	Shovels,	2.20	
1	Coal shovel,	.70	
2	Flue cleaners,	1.50	
1	Fire Hock,	.50	
1	" Rake,	.75	
1	" Hoe,	.75	
1	Stepladder,	.50	
1	Lantern,	.50	
6	Pails,	.50	
1	Wheelbarrow,	1.00	
1	Fumigator,	.75	
1	Oil can,	.15	
1	Putty knife,	.10	
1	Glass cutter,	.10	
1	Hatchet,	.15	
1	Hammer,	.50	
1	Plain,	.25	
1	Iron frame level,	1.25	
1	Square,	.25	
2	Saws ,	2.50	
1	Screw-driver,	.10	
1	Pair Plyers,	.35	
1	" Shears,	.25	
3	German -Pruning Shears,	2.75	
	Totals fwd.	$ 30.40	$1581.71

	Amt. Bro't. Fwd.		$ 30.40	$1581.71
1	Bit & Brace,		.50	
1	Garden Hoe,		.20	
2	" Rakes,		1.50	
400 ft.	Garden hose,		15.00	
2	Tweezers,		.50	
1	Disk,		.25	
1	"Boxter" Register,		20.00	
2	Ice boxes,		8.00	
1	Hand cart,		5.00	
1	Saw file,		.10	
1	Stool,		.15	
3	Chairs,		.75	
1	Clock,		.75	
6	Cloth shades,		.60	
27	Hotbed sash,		27.00	
2	Barrels,		1.50	
1	Brass syringe,		1.00	
16	Building sash,		1.60	
1	Whitewash brush,		.25	
1	Broom,		.15	
1	Delivery wagon,		29.00	
1	Counter scale,		.50	
1	Delivery box,		.50	
1	Tape measure,		.25	
		Total,	$145 .45	
		Less 80 %	116 .36	
				29.09
	Total forward,			$1610.80

		Amt. Bro't. Fwd.	$1610.80

STEAMFITTING TOOLS.

1	Vice.		
2	Dicestocks.		
1	Chain-tong.		
4	Pipetongs.		
1	Pipe cutter,	Total,	25.00
		Total Greenhouse,	$1635.80

STOCK OF BONE FERTILIZER.

15	1940 Tons	@	$25.00	$399.25

INVENTORY I. C. Co. - Nov. 30th. 1902.

NURSERY - STOCK.

FRUIT TREES.

50	Apples- N. W. Greening	8-9 ft.	@	.20	$ 10.00	
100	" " " "	6-7 "	@	.15	15.00	
40	" " " "	4-5 "	@	.08	3.20	
119	" Yellow Transparent	4-5"	@	.08	9.52	
40	" " "	6-7"	@	.15	6.00	
10	" Duchess of O.	7-8"	@	.20	2.00	
57	" Wealthy	4-5"	@	.10	5.70	
50	" "	5-6"	@	.15	7.50	
50	" "	7-8"	@	.20	10.00	
14	" Haas	5-6"	@	.15	2.10	
31	" "	7-8"	@	.20	6.20	
35	" Crab Hyslop	6-7"	"	.20	7.00	
6	" " Martha	7-8"	"	.25	1.50	
25	" " "	5-6"	"	.15	3.75	
24	" " Wealthy	7-8	"	.20	4.80	
33	" " "	5-6ft.	"	.15	4.95	
25	Plum Burbank	7-8"	"	.20	5.00	
25	" Lombard	4-5"	"	.10	2.50	
15	Cherry, Early Richmond,	5-6"	"	.15	2.25	
30	" Late Duke,	5-6"	"	.15	4.50	$ 113.47

SMALL FRUITS

300	Currants- Large Size-		"	.15	45.00	
550	" medium "		"	.06	33.00	
14	" - black- large size,		"	.15	2.10	
60	" " medium "		"	.06	3.60	
400	Raspberries- red, large size,		"	.10	40.00	
700	" " med. "		"	.07	49.00	
					$172.70	

Totals forward,

	Amt. Bro't. Fwd.			$ 172.70	$ 113.47
150	Raspberries-black, large size	@	.10	15.00	
18	Gooseberries " "	"	.15	2.70	
1000	Strawberries	"	1/4 ¢	2.50	
300	Asparagus,			10.00	
35	Rhubarb,	"	.10	3.50	
					206.40
	Total fruits,				$ 319.87

SHRUBS OF A LARGE SIZE.

20	Deutzia gracilis,	@	.06	1.20	
25	" scabra,	"	.10	2.50	
6	Spirea semperfloreus,	"	.10	.60	
12	" aurea	"	.10	1.20	
62	" Van Houttii,	"	.10	6.20	
7	" " " (extra large)	"	.15	1.05	
29	Philadelphus grandiflora,	"	.10	2.90	
17	" aurea	"	.10	1.70	
6	Weigelia rosea,	"	.10	.60	
5	Viburnum plicatum,	"	.10	/50	
4	Ribis gorsouii,	"	.10	.40	
14	Common Lilac,	"	.10	1.40	
45	Hydrangea panisulata,	"	.15	6.75	
17	Forsythia (golden bell),	"	.10	1.70	
23	Tartarian Honeysuckle,	"	.07	1.61	
4	Japanese Quinse,	"	.10	.40	
	Total shrubs,				$ 30.71

EVERGREEN PLANTS.

4	Norway spruce 8 ft.	@	.50	2.00	
164	" " 4-5 "	"	.25	41.00	
600	" " 1 1/2-2 "	"	.10	60.00	
850	Douglas " 1 1/2-3 "	"	.10	85.00	
120	White Pine 1 1/2-2 "	"	.04	4.80	
450	" " 1 1/2-3 "	"	.05	22.50	
				$215.30	
	Totals forward,				$ 350.58

		Totals forward,		$ 215.30	$ 350.58
900	Scotch Pine	3-5 ft.	@ .05	45.00	
680	Norway "	1-1 1/2"	" .03	20.40	
40	Arborvitaes,	3 "	" .05	2.00	
90	Suropean Larch	4-7 "	" .05	4.50	
		Total Evergreens,		$ 287.20	287.20

SHADE & ORNAMENTAL TREES.

83	Honey locust,	4-6 ft.	@ .05	4.15	
53	SilverMaple	7-8 "	" .20	10.60	
2	Norway "	7-8 "	" .20	.40	
50	Horse Chesnut	5-6 "	" .20	10.00	
41	Mt. Ash	10-12"	" .25	10.25	
46	Box Elder	6-7 "	" .20	9.20	
30	Laurelleaf Willow	6-7 "	" .15	4.50	
52	American Elm	9-11"	" .25	13.00	
86	Carolina poplars	9-10"	" .20	17.20	
17	Goldenbark Willows	12-14	" .20	3.40	
6	European Birch	8-9 ft.	" .25	1.50	
12	Weeping Willows	6-7 "	" .25	3.00	
4	" Elm	6-7 "	" .25	1.00	
18	" Mt. Ash	5-7 "	" .25	4.50	
270	Willows Asst'd.	3-7 "	" .05	13.50	
20	Judas Trees	3-4 "	" .15	3.00	
29	Populas Bolleana	4-6 "	" .05	1.45	
420	Caragana (Pea Tree)	3-4 "	" .05	21.00	
50	Mt. Ash	4-5 "	" .05	2.50	
4	Lombard Poplar	8-10"	" .15	.60	
12	" "	6-7 "	" .12	1.44	
170	" "	4-5 "	" .10	17.00	
		Total Shade & O. Trees,		$ 153.19	153.19
		Total forward,			$ 790.97

		Amt. Bro't. Fwd.			$ 790.97
	VINES & CREEPERS				
9	Wisteria	@	.10	.90	
9	Chinese Honeysuckle	"	.07	.63	
10	Akebia,	"	.10	1.00	
2	Clematis paniculata	"	.12	.24	
70	" graveola	"	.07	4.90	
100	Clematis Variatatis	"	.10	10.00	
45	" Vitalba	"	.07	3.15	
320	Ampelopsis Quinqefolia	"	.07	22.40	
2	" Englemanii	"	.12	.24	
250	Celastrus scandens	"	.03	7.50	
200	Begonia Radicaus	"	.04	8.00	
1675	Lycium Barbatum	"	.03	50.25	
		Total vines & creepers,			$ 109.21
	ROSES.				
4	Rosea rugosa (large)	@	.15	.60	
20	" " Mad.Bruant	"	.12	2.40	
10	Crimson Ramblers	"	.12	1.20	
1	Yellow "	"	.12	.12	
24	Rosa rugosa rybra	"	.15	3.60	
250	" " asst'd.	"	.05	12.50	
25	" arvensis	"	.05	1.25	
275	" Rubignosa	"	.05	13.75	
25	" Polyantha	"	.07	1.75	
25	" Multiflora	"	.07	1.75	
5	" Moss	"	.10	.50	
		Total roses,		$	39.42
	SHRUBS OF MEDIUM SIZE				
95	Crateagus Coox Gali	@	.05	4.75	
175	Berberis purpureae vulgaris		.05	8.75	
10	Deutzia gracitic		.05	.50	
28	Syringa Japonica		.05	1.40	
25	Sambucas alba		.05	1.25	
				$16.65	
		Total forward,			$ 939.60

		Amt. Bro't. Fwd.			$ 790.97
	VINES & CREEPERS				
9	Wisteria	@	.10	.90	
9	Chinese Honeysuckle	"	.07	.63	
10	Akebia,	"	.10	1.00	
2	Clematis paniculata	"	.12	.24	
70	" graveola	"	.07	4.90	
100	Clematis Variatatis	"	.10	10.00	
45	" Vitalba	"	.07	3.15	
320	Ampelopsis Quinqefolia	"	.07	22.40	
2	" Englemanii	"	.12	.24	
250	Celastrus scandens	"	.03	7.50	
200	Begonia Radicaus	"	.04	8.00	
1675	Lycium Barbatum	"	.03	50.25	
		Total vines & creepers,			$ 109.21
	ROSES.				
4	Rosea rugosa (large)	@	.15	.60	
20	" " Mad.Bruant	"	.12	2.40	
10	Crimson Ramblers	"	.12	1.20	
1	Yellow "	"	.12	.12	
24	Rosa rugosa rybra	"	.15	3.60	
250	" " asst'd.	"	.05	12.50	
25	" arvensis	"	.05	1.25	
275	" Rubignosa	"	.05	13.75	
25	" Polyantha	"	.07	1.75	
25	" Multiflora	"	.07	1.75	
5	" Moss	"	.10	.50	
		Total roses,		$	39.42
	SHRUBS OF MEDIUM SIZE				
95	Crateagus Coox Gali	@	.05	4.75	
175	Berberis purpureae vulgaris		.05	8.75	
10	Deutzia gracitic		.05	.50	
28	Syringa Japonica		.05	1.40	
25	Sambucas alba		.05	1.25	
				$16.65	
		Total forward,			$ 939.60

MICHIGAMME - COMPANY.

I N V E N T O R Y

O F

MACHINERY AND EQUIPMENT

N O V E M B E R 30th. 1902.

MICHIGAMME COMPANY.

Record of Machinery and Equipment.

Dwellings.

No. as follows:

1 Dwelling.
2 " & barn.
3 " & barn.
4 Old office(with vault) now dwelling.
5 " "
6 " "
7 " "
8 " "
9 " "
10 " " (reported sold)
11 " " (" ")
12 " "
16 " "
17 " "
18 " "
19 " "
22 " "
23, 25, 26, 27, 28, reported sold.
24 Dwelling.
29 "
40 (Reported sold)
41 Dwelling.
42 "
43, 44, 45, 46, Dwellings.

MICHIGAMME COMPANY.

Record of Machinery and Equipment.

Mine Buildings.

No.	
13	Frame barn.
14	" shed (Castings)
15	Office and Warehouse.
31	Frame harness shop.
32	Log House (very poor)
34	Frame Lime House.
36	Stone Powder House.
38	Frame blacksmith and carpenter shop.
20	" Main Dry.
	Pump House.
	Frame Pipeman's shanty.
	Frame blacksmith shop (20 x 35 near No. 5 shaft)
	Shift Boss dry & Carpenter shop attached.
	Frame Timberman's Dry.
4&6	" Shaft Houses (good repair)
5&7	" " " " "
	1 " Pocket near R. R. Track (fair condition)
	2 " Shaft Houses (bad repair)
	1 Stone engine and boiler house with addition for machine S.
	1 Coal Pocket.
	1 Frame Engine House (very poor)

MICHIGAMME MINE.

Record of Equipment.

Plant - In Stone Engine House.

1	28 x 36 Hoisting engine, Hodge slide valve-link cut off,	$700.00	
	Geared by "V" friction to four 8 ft.Drums,	1000.00	
3	Dynamos,	100.00	
1	18 x 42 R. Allison Duplex Air Compressor,	1250.00	
1	Air Compressor Cylinder 18 x 24	200.00	
	(Duplicate of duplex compressor cylinder connected to main shaft of hoisting engine, has never been used.)		$3250.00

CORNISH PUMP DEPARTMENT.

1	Cornish Pumping Engine,		75.00
1-7 1/2 x 7 Plunger Pole 1-4 3/4 Bishop Head, 2-4 1/2 x 10 Pillow Blocks,			47.00

MACHINE SHOP.

	Shafting, Pulleys, Bearings etc.	$25.00	
1	7 x 10 Shop Engine,	87.50	
1	W. B. Bennett & Son Planer 6x24x30,	250.00	
1	" " " 34" Engine Lathe 11'6"x7,	500.00	
1	Drill Press 16" with chucks(W.B.Bennett & Son)	75.00	
1	2" bolt cutter and diss,	150.00	
1	Lot Machine Shop tools,	15.30	
1	28" x 7" Grind stone & frame,	10.00	1112.80
	Total forward,		$4484.80

MICHIGAMME MINE.

Record of Equipment.

			Total for'd.	$4484.80

DIAMOND DRILL DEPARTMENT.

Powder House.

5	Pcs. 8 ft. Rods	(No good)	Scrap.	
4	" 6 " "	"	"	
30	" 4 " "	"	"	
	Miscellaneous parts,	"	"	
1	Bullack Port Hoist,	"	"	
1	American D. Drill,	"	"	
				25.00

Parts Old Machinery In Shed

NEAR BARN.

1	12 x 18 Atlas Engine from separator,	Scrap.	
1	3 1/2" Shaft 12' long,	"	
2	3 1/2" x 10 " Pillow Blocks,	"	
12	Different size pulleys,	"	
1	Fly Wheel about 6 ft.	"	
	Several Gear Wheels & Scrap pieces from separator,	"	40.00
	Total Amount,		$4,549.80

MICHIGAMME COMPANY.

MATERIAL IN OLD HARNESS HOUSE.

1	Saddlers Bench,	
1	Wheelbarrow Wheel,	
	Several Pieces Old Harness,	
1	Double bitt Ax,	- No Value.
1	Old wood wash sink,	
1	Cupboard,	
1	Fly net,	

B A R N.

1	Seeder,	
9	Scythe Snaths,	
5	Old hay racks,	
1	Ox Yoke,	
3	Potato hooks,	
2	Forks,	
1	Light neck yoke,	
12	Old Scythe blades,	
1	" Cutter,	- No Value.
2	Broken scales,	
1	Skid runner,	
1	Set tugs & breeching,	
1	Grind Stone,	
6	Cart horse saddles,	
6v	Sweat pads,	
1	Root cutter,	
2	Cultivators,	

B A R N.

Continued.

1	Potato digger,	
3	Plows,	
1	Kettle,	- No Value.
1	Grapple hay fork,	
2	Neck yokes,	
1	Jug,	
1	Light wagon (fair condition)	

THE CLEVELAND-CLIFFS IRON COMPANY.

E Q U I P M E N T

G R A N D I S L A N D

1 9 0 3.

THE CLEVELAND-CLIFFS IRON COMPANY.

EQUIPMENT, GRAND ISLAND - NOVEMBER 30th. 1903.

1	Wagon- 3½ x 2 teaming gears, 6" tire, whiffletrees and neck-yoke	$ 150.00	
1	Special wagon box with seat and 2 extra seats	24.00	
1	Saddle and Bridle	15.25	
1	2 Seated Wagon complete	48.00	
1	Single surrey harness	18.00	
1	Horse	96.30	
1	Horse	221.30	
1	Mare	236.30	
2	Horses	511.40	
2	#1 Sq. B. Wheel scrapers	44.00	
2	3 x 1/2 x 11 teaming gears 6" tread whiffle-trees and neck-yoke	155.55	
2	Special Dump carts complete	90.80	
2	Special Cart harness "	38.81	
		$1649.71	
	Less 25% depreciation	412.43	
			$ 1237.28

THE CLEVELAND - CLIFFS IRON CO.

MEMORANDUM OF SUPPLIES & EQUIPMENT ON GRAND ISLAND

YEAR ENDING NOV. 30th. 1902.

CLEVELAND - CLIFFS IRON CO.

MEMORANDUM OF SUPPLIES AND

EQUIPMENT ON GRAND ISLAND

YEAR ENDING NOVEMBER 30th. 1902.

MACHINERY AND IMPLEMENTS.

1	No. 1 X S.C. Peerless Plow,	10.00
1	" 1 R. & G. Oliver Chilled Plow,	25.85
1	Adjustable spring tooth harrow,	14.50
2	No. 1 Wheel Scrapers,	48.00
2	Drag "	4.00
1	Indiana Reversible Road Machine,	229.71
1	Wheel Barrow,	.50
1	Decking chain, (30 ft),	4.50
1	Draft " (16 ft.),	2.00
1	Long handle shovel,	.50
20	Corn grading "	10.00
13	Axes (poor),	.00
13	" (fair),	5.00
21	Grub hoes "	8.00
1	Broad ax,	2.00
5	Picks,	2.00
1	Adze,	1.25
2	Decking Blocks,	2.00
1	Set Doubletrees,	2.50
2	Stump augers 1 1/2 in.	1.00
1	Dynamite boiler,	4.35
4	Cant hooks,	3.50
2	Drill hammers,	1.25
1	Crowbar,	1.00
2	3 ft. Drills,	.75
	Total forward,	$ 384.16

	Amt. Bro't. Fwd.	384.16	
1	6 ft. Drills,	.60	
1	Sledge hammer,	1.75	
4	Cleveses,	.40	
1	Doz. Ax handles,	2.40	
1	1/2 in. Bridge auger,	.75	
1	Monkey wrench,	.50	
3	Carpenter's hammers,	.85	
1	Hand Saw,	.65	
2	6 ft. Cross cut saws,	8.00	
1	Putty knife,	.10	
1	Scow,	50.00	
	Total Mach'y & Eqpt.		$ 450.16

CAMP EQUIPMENT.

48	Double prs. blankets,	60.00	
1	Air tight heating stove,	5.50	
1	Box stove,	8.00	
27 1/2	Lengths 6" stove pipe,	3.50	
4	Elbows 6"	.60	
5 1/2	lengths 7" stove pipe,	.80	
2	Elbows 7"	.30	
1	Camp cook stove,	39.35	
1	Family " "	20.00	
4	Doz. forks,	2.00	
4	" teaspoons,	.40	
4	" tablespoons,	.50	
4	" knives,	2.00	
5 1/2	" Tin plates,	2.50	
5	" " cups,	3.00	
46	2 qt. basins,	1.84	
9	Earthen bowls,	1.00	
3	Batter spoons,	.30	
	Total forward,	$ 151.59	$ 450.16

	Amt. Bro't. Fwd.	$ 151.59	$ 450.16
1	Egg beater,	.10	
3	Butcher knives,	1.00	
3	Ladles,	.10	
7	Tin pails,	1.40	
2	Iron pots,	.80	
3	Dish pans,	1.75	
5	Stew kettles,	2.00	
1	Steamer,	.35	
1	Potato masher,	.10	
2	Muffin tins,	.15	
5	Dripping pans,	3.00	
1	Chopping bowl,	.15	
2	Skimmers,	.20	
1	Nutmeg grater,	.05	
1	Cooky cutter,	.05	
1	Doughnut "	.15	
6	Pepper shakers,	.30	
7	Salt "	.35	
1	Flour sieve,	.10	
1	Rolling pin,	.10	
1	Meat fork,	.05	
1	" cleaver,	.75	
1	Steel "	.70	
1	Meat saw,	.70	
1	Can opener,	.10	
11	Hand towels,	1.00	
1	Alarm clock (no good),	.00	
2	Looking glasses,	.20	
1	Comb,	.05	
2	Dippers,	.10	
	Total forward,	$ 167.44	$ 450.16

	Amt. Bro't. Fwd.	$ 167.44	$ 450.16
1	Pancake turner,	.10	
2	" griddels,	2.50	
1	Dust pan,	.10	
1	Wash board,	.15	
1	" tub,	.15	
1	5 gal. kerosene can,	.45	
7	Lanterns,	2.50	
4	Granite coffee pots,	2.00	
1	Tea kettle,	1.25	
6	Side lamps,	2.00	
2	Hanging "	1.00	
1	Colander,	.15	
6	Wash basins,	.30	
1	Broom,	.30	
1	Mop,	.10	
2	10 oz. duck 14 x 16 tents,	28.10	
1	" " " 12 x 16 "	10.00	
	Total Camp Equip.	$ 218.59	218.59

CAMP SUPPLIES.

30	Cans milk,	2.40	
33	" tomatoes,	4.29	
13	" pears,	1.55	
4	" pumpkins,	.40	
7	" Corn,	.70	
10	" apricots,	1.30	
40	" peas,	3.60	
15	lbs. cheese,	1.95	
3/4	box crackers,	.96	
1/2	" gingersnaps,	1.50	
	Total forward,	$ 18.65	$ 668.75

	Amt. Bro't. Fwd.	$ 18.65	$ 668.75
12	lbs. dried apples,	1.26	
5	lbs. raisins,	.50	
5	" prunes,	.32	
5	" appricots,	.55	
6	" cracked barley,	.25	
4	" tea,	1.36	
10	" coffee,	1.20	
1/4	bl.G. sugar,	4.70	
6	Sacks table salt,	.75	
1	Pk. onions,	.32	
1	bbl flour,	4.25	
10	lbs. oat meal,	1.00	
3	" macaroni,	.12	
1	pk. peas,	.25	
1/2	bu. beans,	1.45	
30	lbs. lard,	3.75	
1	Box soap,	3.55	
20	Lbs. buckwheat flour,	.60	
2	Bottles vanilla,- extract -	.50	
1	" lemon "	.35	
1/2	lb. cinnamon,	.25	
1	" ginger,	.15	
5	" baking powder,	.90	
2	pk. gold-dust,	.44	
1	bbl. kerosene,	5.51	
70	lbs. ham,	9.80	
25	" dry salt pork,	3.25	
10	" corn beef,	.80	
15	" bacon,	2.32	
	Total forward,	$ 69.10	$ 668.75

		Amt. Bro't. Fwd.	$ 69.10	$ 668.75
13	bu. potatoes,		6.50	
32	lbs. butter,		4.16	
1/4	case eggs,		1.70	
3	gal. black strap syrup,		1.20	
2	" syrup,		.70	
400	lbs. dynamite,		42.00	
600	ft. fuse,		4.50	
3	Boxes caps,		2.55	
40	bu. oats,		16.80	
75	2 bu. sacks @ 6 ¢		4.50	
		Total supplies,	$ 153.71	153.71

V A N.

2	pr. high rubbers,		4.20	
4	" low "		5.00	
7	Suits woolen underwear,		10.50	
3	Pr. overalls,		1.80	
4	woolen overshirts,		4.20	
5	pr. woolen socks,		2.50	
3	" leather mittens,		1.35	
3	" " gloves,		1.35	
1/2	doz. pr. suspenders,		1.50	
6 1/4	lbs. hand made tobacco,		3.12	
1	" peerless "		.35	
9 1/5	lbs. spear head chewing tobacco,		4.05	
8	" nigger head,		2.80	
		Total forward,	$ 42.72	$ 822.46

	Amt. Bro't. Fwd.	$ 42.72	$ 822.46
15	Corn cob pipes with stems,	1.50	
1	Tobacco cutter,	1.25	
9	Bottles Hunkley's Bone Liniment,	4.50	
	Total Van,		49.97
	Total supplies & Equipment,		$ 872.43

FURNITURE & TOOLS AT THE COTTAGE.

1/2	Doz. cups - 1/2 doz. saucers,	.63	
1/2	" 6 in. plates,	.50	
1/2	" 7" "	.62	
2	Platters,	.75	
3	Vegetable dishes,	.60	
4	Pepper & salts,	.20	
3	Bowls,	.36	
1	Wash bowl & pitcher,	1.00	
1	Slop jar,	1.25	
1	Glass water set,	.75	
1	Table set glass ware,	.75	
2	Lamps complete,	.90	
1	Box toilet soap,	.25	
1	Bottle ink,	.05	
2	Pen holders,	.10	
10	Yds. carpet,	4.00	
8	" cotten,	1.28	
15	" "	3.30	
2 1/2	" Table linen,	1.88	
1	" cover,	.90	
2	Bed springs,	7.50	
6	Towels,	.90	
6	Napkins,	.63	
2	Iron bedsteads,	11.00	
2	Mattress,	9.50	
2	Pr. pillows,	5.00	
2	Quilts,	3.00	
2	Pr. blankets,	7.00	
1	Commode,	3.00	
1	Extention table,	3.00	
1	Kitchen "	1.75	
2	Rocking chairs,	5.50	
6	Kitchen "	3.60	
8	Curtains,	2.00	
1	Box stove,	8.25	
1	Cook "	15.00	
3	joints 6" pipe,	.60	
6	tea spoons,	.75	
3	table "	.75	
	Total forward,	$ 108.80	$ 872.43

		Amt. Bro't. Fwd.	$ 108.80	$872.43
8#	Zinc,		.80	
24	coat hooks,		.25	
1	Wheel barrow,		2.00	
1	Long handle spade,		.75	
1	Garden rake,		.50	
1	Hammer,		.65	
1	Hand saw,		1.25	
		Total Furniture & tools,		115.00
		Grand total,		$ 987.43
		Less 100 %		987.43

THE CLEVELAND-CLIFFS IRON CO.

ISHPEMING, MICH.

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MASTER MECHANIC'S REPORT

DECEMBER 30th, 1902.

INDEX.

THE CLEVELAND-CLIFFS IRON CO.

Mr. M. M. Duncan, Agent,

Ishpeming, Mich.

Dear Sir:--

I submit herewith annual report of your Master Mechanic on the mechanical equipment of the several mines. Accompanying this report is a monthly summary of our engineer's logs, showing the amount of work done, fuel and oils used, amount of water pumped, amount of air used etc. for the year.

CLIFF SHAFT MINE.

There has been no change in the equipment during the year and we have been fortunate as regards breakdowns and expensive repairs.

HOISTING ENGINE.

The 38" X 36" Hodge slide valve hoisting engine, built in '82 is still in service and has caused no delay during the year. The only repairs of importance made on this machine was a new pinion put on the main shaft that drives the "A" shaft drum on New Years day 1902. We have another pinion in stock and the one driveing the "B" shaft drum will probably have to be replaced some time during the coming year. We are still using the two large gears on the drum shaft with the cracked hubs, but see no reason why they should be changed as long as ~~the~~ we can keep them going without ~~any~~ causing any delays for repairs. We have had some little trouble as usual with the hoisting rope on "B" shaft, one being a case of over-winding and in another case the rope broke near the socket. There is very little head room in "B" shaft house so that we must expect an occasional case of over-winding but [illegible] save us any trouble.

We have not changed the hoisting rope on either shaft and the ropes that were put on when the mine was reopened and are still in use and are still in very good condition, and avoiding accidents will probably last throughout the year.

PUMPING ENGINE.

The pumping engine and cornish pump has given us very little trouble during the past year, the only work of importance being a resetting and realigning of the "B" shaft bob. We are making some investigations to determine the advisability of dispensing with the "B" shaft pump and hope to be able to report on this at a later date. We have pumped from about one million to one million and a half ~~million~~ gallons more per month than last year except during the month of November which is practically the same for each year. I am not quite certain as to the change in the amount of water pumped, but I presume it was partly due to the opening of additional ground and partly on account of the increased rain fall. Table one gives the total rain fall from December 1st 1901 to November 30th 1902.

TABLE I.

Month.	Year.	Snow	Rain
Dec.	1901	20	
Jan.	1902	17	
Feb.	"	11	
Mch.	"	2	2.00
Apr.	"		2.87
May	"		3.15
June	"		2.35
July	"		4.37
Aug.	"		2.40
Sept.	"		1.55
Oct.	"	1.5	3.71
Nov.	"	2	2.85
	Total snow	53 1/2"	
			Rain 24.75

The equivalent amount of precipitation, counting melted snow as rain is 30.10". Table II gives the total amount of water pumped for the years 1900, 1901 and 1902 with the precipitation for each year.

TABLE II.

Year.	Total Precipitation.	Total water pumped.
1900	40,66	345,630,130
1901	27,84	353,314,005
1902	30,10	377,910,450

Strange as it may seem, the year in which we had the maximum precipitation we pumped the minimum amount of water. In 1901 with the minimum precipitation we have had the average amount of water to pump while in 1902 at the average precipitation we have pumped a maximum amount of water. I do not know how to account for this, except on the supposition that we are opening more ground or perhaps owing to the fact that the "B" shaft pole has not as much water as it should have in order to keep it from ge "Going afork!" We have to return a certain amount of water in this shaft to be handled over again as it is necessary to keep the "A" shaft pump running at the proper speed to keep the water out of the lower levels. It is my opinion, however, that we are having less and less water to pump from the ledge at "B" shaft where the "B" shaft pump is located and the increased amount of water is making in the lower levels of "A" shaft as they are being opened up.

COMPRESSORS.

There has been no changes on the compressors or no breakages or repairs of importance during the year. We have had little trouble during the year from breaking crank pins but I believe this is due almost entirely to the replacing of pins by the good grade of steel made specially for this purpose and the proper adjusting of the compressor steam valve for the work whereever possible.

The steam valves on these machines are now set late to compensate for the air in the clearance spaces of the air cylinders at the end of the stroke; as the steam valves were formerly set so that the strain on the crank pins at the beginning of the stroke is greater than the engines were designed for. Since carefully fitting the pins of good material and resetting the valves we have had little trouble. As shown on the logs, the amount of air used has been gradually reduced during the latter part of the year until it now varies from 27 million to 30 million per month. The cubic feet of air used per ton of ore hoisted has also been considerably reduced and now varies from 1270 to 1300 cubic feet per ton while last year the average was about 15 hundred or 16 hundred cubic feet per ton. During 1900 the amount of air required per ton was approximately the same as during the latter part of 1902. These compressors are, of course as uneconomical as they ever were and it appears to me it would be a profitable investment to replace them. The replacing of these compressors with a new machine would save us not less than eight hundred dollars per year.

CLIFF SHAFT CRUSHER PLANT.

The crusher plant is running as it was last year without any material changes. We have had few accidents during the year, the principal repair necessary being a head plate for the Hodge crusher. This was found cracked and a new one secured before the old one played out entirely. We now have little trouble with the rest of these crushers since we substituted new shafts. The old engine is still in service but has had some repairs during the year, the principal one being a new crank pin and some minor repairs at different times. This is probably the most uneconomical engine of any size which we are running.

CLIFF SHAFT AUXILIARIES.

We have made little change in the auxiliary service at this mine. We still have the same old engine in the shop but we should replace it very shortly. It is very badly worn out and is very uneconomical in steam. The other auxiliary engines are a pair of 8X10 duplex engines, located in each shaft house for pulling the cars back from the crusher house, and the 8X10 Russell engine driving the arc dynamo for lighting about the mine. None of these engines have had expensive repairs during the year. The Webster Vacuum System of steam heating has proven very satisfactory in operation the only changes on this system from last year is the instilation of the steam heating system in the dry which was built during the summer to take the place of the old dry burned last February. During the time the mine is running the heating of all buildings is done with exhaust steam from the number one compressor for which we carry a back pressure averaging about two pounds.

BOILER PLANT.

We have made no changes in the boiler room except several necessary repairs to the old boilers. These boilers have long since reached an age when they can be considered safe and I wish to submit herewith the last reports of the Hartford Steam Boiler Inspection & Insurance Co. reporting on their inspection of November 17.

COPY.

REPORT.

18th of Oct to 17th of Nov. 1902, by Inspector W. T. Godfrey.

Eight H. T. Boilers. Cliffs Shaft.

Internally;- All of these boilers except # 1, 2 and 4 have considerable deposite of scale between tubes at rear head; this has caused a mud crack in rear head, in bridge between tubes on #5. (Since been patched.) Braces are sound and taut. Openings clear.

Externally;- Boiler #4 has a small bulge on flat surface of "hog-nose." #2, 3, 4, 6, all have small bulges on fire sheets. These boilers are showing very rapid deterioration and as they are being worked very hard and up to the extreme limit, we think it is now time some steps were taken to remove them. Otherwise we must suspend insurance on them.

They are past the age of the ordinary life of boilers of this type and we do not consider them safe at present pressure of 80 to 85 pounds. Several tubes in bottom row of #8 leaking and beads almost gone at rear head.

Yours truly,

HARTFORD STEAM BOILER Insp.& INS. Co

To Cleveland Cliffs Iron Co.,

Ishpeming, Mich.

Chicago, Ill. Nov. 24, 1902.

Comment on this report is perhaps ~~un~~necessary. Following is a letter from Chief Inspector Foord, a comment on this report.

Chicago, Nov. 24, 1902.

Cleveland Cliffs Iron Co.,

Ishpeming, Mich.

Gentlemen;-

We herewith inclose you report of Inspector W. T. Godfrey, who inspected the boilers in your Cliff Shaft Oct. 18th, and the 17th inst.

Your attention is especially called to that part of the report where Inspector says boilers are showing very rapid deterioration, and are worked hard, up to the limit of pressure. I have made a personal visit to this plant, and find Inspector Godfrey has not overdrawn the facts in the case.

We have also referred to the data and finds that boilers as Inspector states, have already reached an age when they are usually discarded and replaced with new ones. We cannot but urge you to see that

steps are taken to replace these boilers with others capable of carrying the pressure desired in the near future.

Inspector advises us that unless there is a disposition to make some improvements in this plant, insurance should be suspended. We know you wish to keep your steam plants in the best possible condition, and feel it is now time for you to take steps to secure new boilers for this plant.

We shall be pleased to hear from you as to what will be done at this Mine.

Yours respectfully,

James L. Foord,

Chief Inspector.

In this connection will say that we have already made an estimate fora new boiler plant which has been already submitted. This estimate involves an expenditure of $15,350. For 5 72" X 18' boilers without labor saving appliances. This number of boilers will be required if we run our old machinery. I have also made estima te amounting to $22,550, running four boilers with necessary labor saving appliances. These four boilers will be sufficient to run this mine if we installed new compressors. I believe with the last proposition we could dispense with one of the firemen which would be a saving of almost 1400 dollars a year in itself while we could get at least 15% more work from the coal we burn.

It is perhaps, unnecessary for me to add that we must positively take steps to install new boilers at once. I would prefer, however, to buy new boilers for ~~la~~ our Lake plant, get them erected, ready for business and then remove our present Lake boilers to the Cliff Shaft Mine. This would save some expense and inconvenience in making the change at the Lake, and would answer all purposes and provide good boilers for Cliff Shaft.

SALISBURY MINE.

There has been no changes at the Salisbury Mine.

HOISTING ENGINE.

We are still running the 18 X 48 Corliss engine on the ore skip although it is much too small for the work it has to do. We have had no material trouble with it during the year. We should install a large cylinder on this engine whether we make any expensive changes in our power or not. The only repairs of importance to this hoist during the year was caused by the breaking of the three last sound arms in the drum under the brakeband which was overcome by putting in a large circular cast iron plate, bored to fit the hub and then bolting the loose ends of the drum arms to it. We are now running this hoist considerably faster than at any time previous especially when lowering, as we have put on back stringers during the year which prevents the skip leaving the track even when lowering very rapidly.

The wear on hoisting ropes is as great now as it has been at any time since we started this shaft. We seldom get rope to run over three months time and the average life is about two months.

The engine and drum working on the cage have had no repairs at all, and in fact, have very little work to do.

CORNISH PUMP.

The Cornish pumping engine has given us little trouble since the foundation was repaired as described in the last annual report and I do not anticipate much further trouble from this cause, owing to the working of the foundation before it was repaired, it is somewhat out of level but I do not believe will cause us any serious trouble. This pump now works very well since we installed the Hydraulic balance, but it will soon be necessary to add a new lift. The amount of water pumped at this mine is comparitively small, ranging from 5 1/2 million

gallons per month during the winter to sometimes as high as 8 million during the summer season. We have helped this pump very materially by placing a pump in the valley above the mine and pumping the water that formerly came to the mine out of the valley.

AIR COMPRESSOR.

We have made no repairs of importance on the air compressor during the year which, I presume is due to the overhauling it got last year when we made a new strap, cross head pins and also a new crank pin. The amount of air required is still all this machine can possibly make and it is quite too small a capacity for this mine. I believe it would pay us in case we installed a new compressor at either Cliff Shaft or the Lake to take one side of one of the old compressors from one of these plants and attach it to the Salisbury machine. The expense would not be very great;we would only have to build the necessary foundation but we could probably erect a machine for not to exceed $400.

BOILER PLANT.

We have had no repairs to the boilers during the past year but from indications I think we will very shortly be obliged to replace the flues in the two vertical boilers. These flues are very badly crystallized and are beginning to show leakage when the boiler is cooled down or fired up. We still carry 90 pounds on all the boilers but we do not regard the Horizontal Tubular boiler as being entirely safe though the Hartford people have offered no objections thus far. We do not use any live steam outside the main boiler house except for heating the office, the dry being heated by exhaust. The only small engine in use about this mine is a small tram engine, located

in the shaft house for pulling the tram cars from the stock pile which is now worked by air. This is an uneconomical method but I believe it is the cheapest available at this Mine.

CLEVELAND LAKE MINE.

There has been no important changes or alterations at this mine during the year and we have been comparitively fortunate in the matter of delays. The hoisting engine has given us no trouble at all and the only repairs it has had has been on the seats of the throttle valve and the instillation of a pair of cams on the reversing engine. We are occasionally bothered, however, from overloading the skip with the heavy blue ore on third level so that the engine will not start and owing to the shaft not being of sufficient depth below the pocket to enable us to reverse the engine to get it in better position to start we sometimes have considerable delay when the men are careless and overloaded the skip. The new tram cars on third level are considerably larger than the old cars were on second level, so that when a car is heaped full of blue ore the engine is almost sure to be unable to start the load unless stopped at a very favorable location which cannot always be the case.

AIR COMPRESSORS.

The Duplex Rand compressor and the straight lined Ingersoll Sargeant have both been run continuously throughout the year except when one or the other has been disabled for repairs. We had one accident to the right hand air cylinder on the Duplex compressor. This was caused by an explosion in the air cylinder which broke the follower on the piston, a piece of which falling down in the bottom of the cylinder broke the cylinder head. This accident occurred on Aug. 1st and that side was started up again on Aug. 11th. We also ran on one side

from Oct. 20th to Oct. 27th on account of the crank pin on the right hand side getting loose. This got loose on Monday morning and was repaired on the following Sunday. We also trued up the piston rod and valve stem, causing a shut down of one week to each side. The right hand side being shut down from April 14th to April 28th, and the left hand side fromAApril 28th to May 5th. The # 2 compressor was shut down about four total days on two occasions on account of repairs to the piston and inlet valves. Aside from this the # 2 has given us no trouble at all since being installed here in Sept. 1901.
We have effected considerable saving in air at the Lake Mine by having the pipe man take the pipe apart at different places in the mine, known only to himself, and driving a plug into the pipe with a small hole in it and then, connecting it. This was donw to prevent the men working in stopes using too much air for ventilation as there is no way to prevent them from opening their valves wide open which always reduces the air pressure so much that machines do not work satisfactory. The men working in these closed stopes are still able to get sufficient air but no air is being wasted.

ELECTRIC TRAM PLANT.

The 16" X 42" Allis Corliss engine, driving the tram plant, continues to give us considerable trouble. ~~and~~ We made a new strap, key and brasses for the crank pin and also put a support under outer end of the guide. This engine is much too light for the pressure carried.

When we install our new ~~engine~~ plant if we do not provide some electric power, I would suggest that we buy a new engine for this service and use this engine at some other point at lower pressure.

The generator has had no repairs during the year and is still running very satisfactory. We have bought no additional mining locomotives during the year. The # 1 and #3 motors were installed on third

level last year. The #4 motor was also moved to third level on April 1st. since which time we have been running 4 motors, two on second level and two on third. We have had several accidents from motors on the third level, due in a large measure to carelessness on the part of the men. In one accident two motors, #3 with a loaded train and #5 with an empty train ran together, the end piece of #1 motor being broken. We then brought this motor to the shop, gave it a general overhauling, putting it in first class condition and then sent it back to the mine and the #3 motor was then treated in the same manner. This motor gave excellent service after being repaired and appeared as good as new. When the #1 motor had been in service about two months, it was unloading a train of ore at the shaft with one loaded car behind it when a motorman, going to the shaft about one hundred yards back in the mine, attempted to couple a car of rock standing at a shute, hit the car too hard and the brakeman failed to couple it, causing the car to run away down the incline, struck into the car coupled to the motor at the shaft, so hard as to almost completely destroy the #1 motor. It broke both side castings and the end casting so that both were beyond repair, making it necessary for us to order new end pieces and sides from the foundery. We changed the designs of the sides, had new castings made and are rebuilding this motor in the shop. This accident serves as an illustration of the very substantial character of the new cars we have installed on third level as neither of the cars were injured in the slightest while the motor even after the shock had been received by another car was entirely broken up. I understand the grade of this level to be only about 1% and it also illustrates the ease with which these cars run when a car will run away on 1% with sufficient force to do this amount of damage. With the old second level cars and about the same grade in the drift it was not possible to get enough men around the car to move it. We do not have anything like as expensive repairs on these cars, though one principal casting was made too light on the

original lot which caused us quite a little trouble and we had to replace them all. The are very easily dumped and I believe never get unlatched on the road and spill very little ore along the track. There would be almost no repairs at all on these cars if we could keep the tracks clean. Owing to the cars on third level running so much easier than those on second level our tramming cost for the year has been very much lower than during the year preceeding. Table III gives the approximate cost of total number of cars and cost per car for the years 1901 and 1902.

TABLE. III.

Year.	Total cars	Total cost	Per car
1901	169,057	$30,919.15	18.29
1902	167,305	25,491.38	15.24

It will be seen while we have not handled quite so many cars in 1902 we still have had more motors in service throughout the year while during last year it was necessary to run but three. It is my opinion that when we get the second level entirely worked out and are entirely rid of the old cars on the second level both our motor cost and car repairs will be still further reduced. A detailed statement of the tram cost will probably be submitted to you by the auditing department and as I have not the complete figures I will not go into it in detail.

MINE PUMP.

The water is handled entirely by the 12, 18 and 6" X 12 ~~Duplex~~ Dean Duplex pump located on the third level. There has been no repairs or alterations to this pump during the year and it is run almost continuously except for short stops for packing and such work. We have removed one of the #10 pumps on the second level and replaced it with a #8 Knowles usingin the #10 for work at the Maas shaft. As soon as the new shaft is finished to the fourth level we should move this pump and set it up at that point. It will save the carrying of steam some 1500 feet through the mine and will also serve to drain the ore to the fourth level. It probably should be done before mining is begun. Our present pump has sufficient power to throw water from the fourth level and has ample capacity to take care of the ordinary amount of water made by this mine.

In the past we have caught all the emergency water from heavy rains and break ups on the second level from which it has been thrown to surface by the #10 Knowles pumps. After the Spring breakup of 1903 it was my opinion that a great part of the flood water will make on the third level from which it will be impossible to lift it to surface with the standard Knowles pump; it will therfore, be necessary to provide some additional pumping capacity at this mine to take care of the floods. It was my opinion that we should provide a pump of not less than 700 gallons capacity capable of throwing 700 feet high to take care of emergencies but I do not think it would be economical to provide anything but a single Duplex pump as this pump would be run but a very few days a year. There are two pumps at the Ashland mine which might answer for this purpose being I believe a 22 & 8 X 24. They I believe will not be needed at the Ashland mine after the present Worthington pump is installed in #9 shaft 10th level as it will serve as relay in case of accident to the new triple pump we will install on 13th. I hope it will not be necessary to install this plant the coming year though we may have

to put it in latter in the Fall.

We have pulled out thr #6 pump in the bottom of the #3 underground shaft as the water is now brought on third level through the rock drift. The only other pump in regular ~~service~~ use is a small pump in the bottom of #1 shaft for pumping out the skip pit which is only run occasionally. The pumping cost at the Lake Mine has been considerably lower than last year, owing to the fact that we have had little trouble from mud and therefore have not been obliged to pump any considerable amount of mud. The minimum amount of water handled was during Feb. while the Dean pump was running, was 101.7 per minute while the maximum amount of water handled was during the month of May, ~~was~~ amounting to 157 gallons per minute. I think it would be profitable to install an electric pump for this mine when we install our pump on the fourth level; 160 gallons lifted 500 feet only requires 10 H. P. so that a 20 H. P. motor would probably be ample to take care of the flow of water. This would certainly be advantageous if we should install an electric tram plant even of small proportions from which we could have current constantly on the mine. By this method we would not need to keep steam in the shaft, the shaft would be cooler, and I believe the shaft timber would last much longer. We would have to install our steam pumps however to act as reserve and also to take care of floods.

LAKE ANGELINE DRAINAGE.

There has been no changes in the Lake Angeline drainage during the year except the substitution of a #10 Cameron for the #10 Knowles which handles the greater part of the water. This was done on account of preferring the Knowles pump to handle sand at the Maas Mine. All the other pumps remain the same as before.

STEAM AUXILIARIES.

The Webster Camp and Lane hoist at #3 shaft, second level, South deposite was removed early in Jan. and a small Lidgerwood was installed in place of it which was run until April 6th when steam was shut off the long run of 4" pipe to this point. Our coal consumption has been materially reduced since that time except during the month of May when we made the maximum amount of air for the year and also pumped a maximum amount of water. There is no question in my mind that these small auxiliary plants with long steam pipes are the most uneconomical units we have in service anywhere. The only other auxiliary engine running at the Lake is the pair of 7 X 10 Duplex engines in the shaft house for handling the cars from the pocket and the 6 X 12 shop engine. This shop engine runs very little, probably not averaging one hour per day. We are still running the fan in the boiler room for forced draft though at a comparitively slow speed.

STOCK PILE TRAM SYSTEM.

This plant worked very satisfactory last year and has started out the same this fall. The old engines were bushed down to 10 X 12 last year and new valves substituted which would give them only half cut off. They have ample power as they handle the Bessemer ore only and gave us comparitively little trouble last year.

LAKE BOILER PLANT.

There has been no changes whatever, in the boiler plant during the past year. We are still using the blower and forced draft on the # 1, 2, 3 and 4 while the #5 is worked with natural draft. At the present time we are using but 4 boilers keeping the other in reserve at all times. We are able to do this on account of the greatly reduced demand for steam and trust it will not be again necessary to operate the five boilers together. When we install a new plant at this mine, I

hope to be permitted to install stokers with coal bins located overhead so that the coal will feed automatically to the stoker and by them be automatically burned so that we may be able to get along with one fireman on each shift. I also hope to be permitted to install economical ash apparatus and fuel economizers in order that we may reduce the boiler capacity as much as possible by getting the maximum amount of heat from each pound of coal burned, using all the waste heat possible and hope such we may have a plant as will make the maximum amount of steam and will make each pound of steam when generated, do the maximum amount of work.

PRESQUE ISLE TRAM PLANT.

We installed last Fall at Presque Isle a tram plant for stocking Lake ore. This plant consists of the 14 X 36 engine from the crusher at Michigamme and a pair ~~and a pair~~ of 54" drums direct coupled, built by the Webster Camp and Lane Co., operated with lever brakes and clutches. Each one of these drums has hold of one end of the rope. We had two four ton cars attached to this rope so that as one car was run out the other was pulled into the pocket. This plant worked very satisfactorily after we got it started and gave us almost no trouble at all while at the same time it was very economical in fuel. The cost of stocking ore with this plant was 8 ¢ per ton but there were a great many difficulties all of which tended to increase the cost. It was necessary to keep two shifts of men though we seldom got ore enough to keep them going. The two shifts could handle from 45 to 50 cars of ore under favorable circumstances though we seldom got this amount during a considerable part of the season when the charcoal furnaces called for ore. We very frequently had but a small proportion though if the weather turned cold we would get all the Lake ore mined and would have the maximum amount of ore to unload when the weather was most unfavorable and the ore was freezing in the cars. The freezing in the car was not as serious an obstacle as we expected it to be, though at times where a car stood over night we would find the ore considerably frozen. For the present year we will

run but one shift at the Island, giving them all the ore they can handle during the day, sending the remainder either to the furnaces or stocking it on the old stock ground with the old end dump cars. I anticipate the cost of stocking at Presque Isle will be considerably lower per ton by this method than it was last year.

CLEVELAND.

3 Engine House.

There has been no changes at this plant whatever. We are still running the left hand hoisting engine and the # 1 drum hoisting ore from the Moro. The compressor has had no repairs of importance during the year and has caused no delays. This machine is doing about all the work it can do and has not a reserve capacity for more that two drills. We have had no repairs to the boilers. We are still running two boilers at a time. We keep one down for cleaning so that the old boilers 1, 2 and 4 are used alternately. There has been no objections raised to this boiler plant, by the Hartford Inspector.

MORO MINE.

4 Engine House.

The Cornish pump has caused us some little delay at various times during the year from breakage of parts under ground but the equipment on surface has given us no trouble whatever. The two old boilers are still in service. They had no repairs of importance but we have been obliged to cut the ~~crusher~~ pressure down to 75 pounds ~~and~~ on the # 1 boiler and 65 pounds on the # 2. We should have 90 pounds on the engine for good work but are not permitted to carry in excess of the above on account of boilers. It will not be very long before one of these boiler will have to be replaced with a more modern one.

HARD ORE SHOP.

There has been no change in the tools of equiptments during the year except the addition of a 26" & 48" X 26ft bed McCabe doubled spindled lathe which will swing 19' 5" between centers. This lathe has a tripled geared face plate and will swingwork up to 48" and almost 20' long. It has been set up temporily alongside our planer but when the needed addition to the shop is completed it will be moved and set up on a foundation in what is now the blacksmith shop. We are very seriously over crowded in this shop, owing to the large amount of work we are doing for the Maas shaft. The Barasa Mine also requires a certain amount of work and we will shortly have the Lucy and Swanzy. When it is remembered that this shop was built to take care of the work of the old Cleveland Hard Ore Mine alone and that when we consider we have added the Lake, Salisbury, the Maas and will shortly add Swanzy and Lucy and also the Negaunee it may be imagined the shop is very much too small for the amount of work required of it. We hope to enlarge the shop by building a new blacksmith shop to be about the size of our present blacksmith shop then to remove the partition and throw the present blacksmith shop and machine shop all in one; to move the large tools into the present blacksmith shop, put up an over-head trolley , capable of lifting about 4tons so that the work may be done readily and economically handled. By this addition we will also have suitable erecting floor which will also be arranged with the over-head trolley. The amount of work being handled in this shop is surprising to one not familiar with it. We have had from one to three # 10 pumps per week from the Maas Mine for some months back. We have rebuilt two timber motors for the Lake Mine, have rebuilt # 1 and # 3 mining locomotives for the Lake and have the #1 in again to be rebuilt as result of collision in the mine, and, in fact, are handling all the heavy work of the company at all its properties. I believe we will find it necessary to add at least one and probably two small lathes swinging from 12" to 16" with 6 or 7 foot bed during the next year as we will not be

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able to keep up our repairs especially on Rand drills and Rand drill supplies when we get the increased work from these new properties, as the shop stands at present. We are always waiting on lathe work while last year we were greatly delayed on account of drilling facilities. Up to the last few weeks we have been delayed on account of large lathe work, but this work is now caught up. We have been delayed more or less all year on account of work from the small lathes and I believe there will be no question of the necessity of providing one or two additional small lathes, when these changes in the shop are made.

MAAS MINE.

The three 66 X 18' boilers formerly used at the Michigamme Mine has been set up at the mine and we have had two in operation since some time in April . Work was begun on sinking the shaft Feb. 10th. We installed the pair of engines 12 X 16 geared to two four foot drums formerly at # 3 shaft Lake Mine. This is a most admirable hoist for sinking purposes, will easily handle three tons and has been very satisfactory. We have made no additions to the shop equipment nor have we found it advisable to keep a machinist at this point as we have had the pumps taken to Hard Ore shop for repair. We began sinking the shaft Feb. 10th and struck water at a depth 51' 6", starting the pump at 12:20 P. M. Feb. 21. From the start these pumps have handled immense quantities of sand and I believe the mixture of sand and water has run as high as 60 % in sand. One pump was able to do the work except during sudden boils or sudden rushes of water until about July since which time we run almost two pumps continuously. We have worn out a pump in a short time as four days in pumping sand continuously, though they sometimes last much longer than this. We have three # 10 Knowles pumps in the bottom of of the shaft, two # 10 Camerons and a 10", 6" X 10" Prescott in reserve, above. The repairs of these pumps have been very heavy but there is no question that the most economical way of handling the sand is by pumping. We have no counters on these pumps but have kept an approximate account of the number of revolutions per minute which has been recorded

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from time to time on our logs upon which we have approximated the total number of gallons pumped per month, the number of cubic feet of sand hoisted from the shaft in the bucket is also given but it is my opinion that we have pumped at least 10 times as much sand as has been raised with the hoist. I fear we will not be able to get the water to surface ~~much longer~~ by handling ~~xxx~~ once much longer as the pumps are now run with wide open throttle and when they "Go afork" there is danger or them knocking off the heads or other damage and we have already had some cases of this so that it may be necessary before we reach the ledge to rehandle the water though I hope we will be able to get along without this inconvenience.

BARASA MINE.

The equipment at the Barasa Mine consists of one fire box boiler about 30 H. P. and one horizontal tubular boiler 60" in diameter, 16' long which I do not consider at all safe for the pressure it is necessary to carry at this mine. This boiler came on Lake Superior from the Delamiter Iron Co., New York City, and was purchased with the first hoisting plant equipment that went to the Champion Mine. I understand this was somethirty years ago while the hoisting plant has not been in service for many years and has been broken up for scrap. I examined this boiler in company with a boiler maker and neither of us consider it at all safe ~~xxx txxx~~ above 60 pounds steam at this mine. It is decided to move this out and substitute a 50 H. P. fire box boiler, capable of carrying 125 pounds steam. The hoist is a small Lidgerwood hoist with one 4' drum geared direct to a pair of 10" X 12" link engines, there being no clutches of any kind, in order to lower the skip it is necessary to reverse the engine and let them run down. There is also a straight line Rand compressor 10, and 10 X 12 cylinders, capable of running from two to three machines. We found one small puffer for use under ground, one #5 Knowles pump, one #5 Cameron and a #10 Knowles in the bottom of the shaft, also a #8 Knowles and understand there is a #8 Cameron together with the Knowles sinking pump. The latter we do not consider of any value, whatever. We have not seen all this machinery as the water is not quite all out. We found 2 #10 Cameron pumps in an old sand shaft some 1200 feet south of the present shaft and as the water has got quite low we recovered these pumps with very little expense. There is but one skip in the main shaft of this mine though there is a compa rtment in the shaft where a second can be instal ed, and the hoist is suitable for hoisting in balance and when handled in that way will be capable of raising a very fair product.

ASHLAND MINE.

We now have a complete set of logs for the year from the Ashland which show the amount of work done there and give detailed information of same as we now have on all our other mines. We have made no changes in the hoist equipment except that we have started the #5 drum on the left hand engine for handling the cage in the new # 9 shaft. We have changed the throttles on the hoists and placed an operating lever so that it can be reached by any brakeman on any of the platforms so that any brakeman can controll the steam to suit himself. This was an absolute necessity on account of the platform from which the # 5 drum was handled, being located some distance from the main platform on which the former throttles were located.

COMPRESSORS.

The 18 X 42 Ingersoll Seargant compressor is still in service the only important repairs it has had during the year being some new air discharge valves and new set of piston inlet valves. During the summer we have had considerable trouble with these valves as well as the ones in the machine at the Lake. This was owing to wear they not having been repaired for several years and after the trouble was located it was easily overcome. We made one new cross head pin for the engine which I believe were the only repairs required by this machine this year. This compressor has to work very hard as we are making from 30 to 38 million cubic feet of air per minute. I ~~hope~~ trust the amount of air required will soon be reduced as the rock work in connection with the new # 9 shaft will soon be completed.

MINE PUMPS.

There has been no material changes in the mine pumping equipment. We now run the Prescott compound in the 15th level, #3 shaft with a pumpmen on one shift only. We will very shortly install the compound Worthington pump on the 10th level #9 shaft and already have the piping completed to this point and have set up the small Duplex Prescott pumps formerly in #7 shaft as relays to handle the water while the Worthington pump is being moved. During the month of May 1903 we expect to erect a Prescott Duplex triple expansion pump on the 13th level and bring all the water in the mine to this point where it will be handled by one pump and one crew of men. This will effect a considerable saving as shown by the following estimate:

COPY. ~~-ASHLAND MINE.-~~

Ishpeming, Mich., Dec. 19, 1902.

Mr. M. M. Duncan, Agent,

Ishpeming, Mich.

Dear Sir:--

Following is my estimate of the saving that will be effected by the installation of the Triple Expansion mine pump, based on the handling of 334 galoons of water per minute which I find is the average for the last year:

Estimated cost of fuel used per day----------	$13.00
2 pumpmen at $2.10 per day----------	4.20
Oil, waste, pk'g and repairs----------	1.00
Part of pipeman's time----------	1.00
Total operating cost per month.	$546.00

Average cost of operating old pumps.

As per power cost statement----------	$2733.16
Estimated saving per month.----------	2187.16
Total estimated saving per year----------	25,244.92

It is my opinion that when the present pumps are instal[illegible] in

the # 9 shaft and the pumps are stopped in #3 shaft that we will reduce our pumping expense about $1000.00 per month. The remainder of the saving will be effected by the new Triple pump.

Very truly yours,

M. M.

BOILER PLANT.

The pair of 72" X 18' Horizontal Tubular boilers are now in service, being started early in Nov. We removed two of the oldest boilers in the plant. The boiler plant now consists of the two 16" X 16' twin boilers #'s 1 and 2. The two 66" X 16' Parish the two Stirlings and the two new ones. Owing to the use of some poor Illinois coal we are compelled to run eight boilers a good deal of the time but expect when the mine pumps are moved to the #9 shaft to be able to get along with six, and hope when the new pump is installed and we have got coal to be able to run the entire plant with the Stirling boilers and two new tubulars. This will crowd these boilers quite hard but we hope they will be able to do the work.

Auxiliaries.

There has been no change in the auxiliary service. We are still running the Nic automatic shop engine which is getting quite badly worn and is much too small for the work. In addition to this engine, we are using live steam for heating in the dry, warehouse, captain's office Doctor's office and labratory. We should install a Webster Vacuum System of steam heating at this mine as it would save us considerable money for fuel and when the pumps are stopped in #3 ~~shaft~~ and # 4 shaft we will have a five inch steam line well covered which could be used for this purpose.

TRAM PLANT.

We bought from the Lake Shore Engine Works a tram plant some what similar to the one at our Lake mine though with much better engines; the plant consists of a pair of 10 X 12 slide valve engines and 4 36" shives the engines being connected to one of the drum shafts, the other shaft being geared to it. We have some little difficulty with the clutches but think this plant will be in perfect order. We have built a couple of trestles and will use self dumping cars similar to the ones in use at our Lake and Presque Isle trams. This plant is for handling ore from the new #9 shaft and the greater part of the ore will be handled at this point.

CARP RIVER.

We built a Weir in Carp River and began taking measurements June 24th since which time we have had a reading each day of the height of water flowing for the year from which we have calculated the flow in cubic feet. Table # 4 gives the total precipitation for the month, the average flow for the month and the H. P. per hundred feet fall for the average flow. The figures given for the month of November are for the first 13 days only, as we have had a case of very high water on that date and had to remove the splice boards on top of the damn. I have not remeasured the overflow capacity of the damn since that time and cannot figure the total amount of water flowing.

TABLE IV.

Month.	Precipitation.	Avg. flow.	Avg. H. P. per 100' fall.
June.	2.35	4192	763
July.	4.37	4990	945
Aug.	2.40	2544	482
Sept.	1.55	2942	557
Oct.	3.71	3373	642

The minimum flow was on Aug. 29th., amounting to 1994 cubic feet an equivalent to 408 H. P. per hundred foot fall. The maximum flow was on November 13th., giving 15,144 cubic feet or equivalent to 2668 H. P. a hundred foot fall. From readings up to the first of December, I do not believe it will be very difficult to provide sufficient storage to bring the average of this stream up to from 2500 to 3000 cubic feet minimum flow. We have no survey of this river and I do not know how much fall we can develop so cannot go into the discussion of the problem very fully. I believe our minimum flow will reach 1200 feet per minute during the winter, though this is simply a guess. As to the cost of developing power, it will be impossible to state until we have made surveys of the river and know what fall we would be able to get.

GENERAL RECOMMENDATION.

Owing to the fact that the number of mines worked in this county are being continually added to, it still appears to me that the most profitable disposition of our power will be the use of the electricity but owing to the number of mines working the cost would be very high, approximating very close to $700,000. I do believe, however, that we would find it very profitable to install four or five hundred electrical H. P. which would take care of our lighting and the most uneconomical units. Replace our small engines do our pumping and perhaps some hoisting at small properties. After the installation of the new plant at the Lake and the removal of Lake boilers to Cliff Shaft, I believe we should take up the installation of an electrical unit of this size to be located in Cliff Shaft engine house as I believe it would be a very profitable investment. Whether we could secure the amount of power from Carp River for this small work remains to be determined by the datta obtained from the weir during this winter. I may add, however that the amount of power from this electric unit would be greater during the winter than it would be during the summer and it is during that time we would have a minimum flow of water in the river.

All things considered, I believe the past year has been a very satisfactory one in the mechanical department as we have been free from any serious breakdowns and delays. Our expense of maintenance has been comparitively low and on the whole, I believe the year has been very satisfactory. We hope to do better next year and while the mechanical department will be unusually busy with the installation of ~~the~~ new plants at the new properties we hope to be able to make a good showing.

Respectfully submitted,

Will Q. McKee

M. M.

Lake Superior & Ishpeming Railway Co.
Munising Railway Co.
Marquette & Southeastern Railway Co.

W. G. MATHER,
PRESIDENT.
H. R. HARRIS,
GENERAL MANAGER.
H. A. ST. JOHN,
AUDITOR & GEN'L FRT. & PASS. AGT.
A. WARD,
SUPT. MUNISING RAILWAY.

Office of General Manager.

MARQUETTE, MICH. February 11th.,1903

Mr. W. G. Mather,

President, L.S.& I.Ry.,

Cleveland,Ohio.

Dear Sir:-

I hand you herewith detailed report of operations for the year 1902.

Length of Tracks Owned and Leased.

MAIN LINE.		Miles
Owned - West End Merchandise Dock to C.& N.W.Conn.,Ishpeming		19.94
Leased- C.& N.W.Connection to Cleveland Lake Connection		.92
		20.86

SIDINGS OWNED.

Presque Isle	36271.7	
Dead River	2091.5	
Eagle Mills	1562.6	
Queen Mine Station	1522.8	
Queen Mine Spur	1353.0	
Foster Mine Connection	947.3	
Negaunee	645.0	
Ishpeming	14000.7	
	58394.6	11.06

Lake Superior & Ishpeming Railway Co.
Munising Railway Co.
Marquette & Southeastern Railway Co.

W. G. MATHER, President.
H. R. HARRIS, General Manager.
H. A. ST. JOHN, Auditor & Gen'l Frt. & Pass. Agt.
A. WARD, Supt. Munising Railway.

Office of General Manager.

MARQUETTE, MICH.,

W.G.M.#2. Ford. Miles 31.92

SIDINGS LEASED - ISHPEMING.

C.& N.W.	- Lease of January 2,1897 -	28383	
C.& N.W.	- Lease of August 1,1900 - Expires Dec.31,1904	5800	
C.& N.W.and D.S.S.& A.-	Lease of August 1,1900 - Expires Dec.31,1904	25770	
D.S.S.& A.	Lease of August 1,1900 Expires Dec.31,1900	11172 ✓	
		71125	13.47
	Total Sidings		24.53

	Main	Sidings	Total
Total Length of all Tracks Owned	19.94	11.06	31.00
" " " " " Leased	.92	13.47	14.39
Total	20.86	24.53	45.39

The mileage has been increased this year by new sidings owned of 0.17 miles. Sidings laid and taken up being as follows:

		Laid.	
Presque Isle -	Coal Trestle Track	822.0	
	Coal Trestle Track Crossover	283.0	
	Coaling Track at Bin	820.0	
	Coach Track	693.0	
	Crossover-Main Line	194.0	2812.0
Negaunee -	Freight Station		645.0
Ishpeming -	Freight Station		615.0
			4072.0

		Taken Up	
Presque Isle -	West "Y"	754.1	
	East "Y"	2203.0	
	Goodman's Spur	236.0	3193.1

Net increase 878.9 ft. 0.17 mi.

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The sidings taken up,were relaid elsewhere,as shown,and M.& S.E.main track is now laid about where the East "Y" was located.

The M.& S.E.paid for grading and relaying a storage track equal to that taken at end of East "Y".

MAINTENANCE OF EQUIPMENT.

EQUIPMENT OWNED.

ENGINES.

Consolidated Compound	4
Consolidated Simple	2
Six-wheel Switch	5
Four-wheel Switch	3
	14

CARS.

Combination Passenger and Baggage	1
Coaches	3
Steel Ore Cars - 100,000 lbs. capacity	90
Wooden Ore Cars- 60,000 lbs. capacity	400
Flat and Gondola cars - 60,000 lbs. capacity	20
Four-wheel Cabooses	4
	518

being the same as for 1901.

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Repairs to engines were as follows:

Eng.	Labor	Material	Total	Mileage on L.S.& I.	Cost per Engine Mile for Repairs -cents-
1	$ 486.18	230.07	716.25	18407	3.84
2	502.04	246.74	748.78	19934	3.76
3	408.54	220.47	629.01	19534	3.23
4	390.77	154.95	545.72	13178	4.14
5	735.62	516.54	1252.16	13135	9.53
6	692.73	398.11	1090.84	17828	6.12
7	461.49	427.70	889.19	22011	4.04
8	122.15	38.63	160.78	3680	4.37
9	225.65	232.12	457.77	15403	2.97
10	47.57	59.49	107.06	17693	0.61
11	106.87	51.04	157.91	10762	1.47
12	155.91	118.23	274.14	9201	2.98
13	75.03	28.32	103.35	3951	2.62
14	73.44	27.24	100.68	3848	2.62
	$4483.99	$2749.65	$7233.64	188565	3.84

Foreign Engines.

M.& S.E. 31	218.59	175.28	393.87	11724	3.36
	$4702.58	$2924.93	$7627.51	200289	3.88
Cost of Engines 12,13 and 14			9258.11		4.62
			$16885.62		8.50

Comparison with 1901.

Total	$4769.56	$4161.55	$8931.11	207000	4.32
Inc.			$7854.51		4.18
Dec.	66.98	1236.62		6711	

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Engines 12,13 and 14 were exchanged for other secondhand engines rebuilt by F.M.Hicks,Chicago,the price being $3800.00 each at Chicago,the old engines being taken at $1000.oo each at Marquette. Freight both ways,makes the net charge to this company for the three engines $9258.11,or $3086.04 each. Deducting the charge for the new engines,which were charged to Operating Expenses,the decrease in repairs to engines as compared with 1901 was $1303.60

The mileage according to this statement shows a decrease of 6711,but in 1901 the above statement included 9659 miles made for other roads and individuals. Taking L.S.& I.mileage proper,there is an increase of 2948 miles as shown on page 8 of Exhibit Book.

Comparative Engine Expense per mile was as follows;not including cost of new engines:

		1902	1901	1900	1899
For repairs	cents	3.88	4.32	2.43	4.21
" fuel	"	14.67	12.89	13.32	10.50
" stores	"	.52	.47	.47	.50
" Engineers and Firemen	"	6.08	6.28	6.44	6.23
" Hostlers and Wipers	"	2.25	1.83	2.01	1.88
		27.40	25.79	24.67	23.32

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Repairs have decreased .44 cents per mile

Fuel has increased 1.78 cents per mile

Stores have increased .05 cents per mile

Wages engineers and firemen have decreased .20 cents per mile

Hostlers and wipers have increased .42 cents per mile

Total Expense has increased 1.61 cents per mile.

Fuel charged out in 1900 at $2.85;in 1901 at $2.90;and in 1902 at $2.74 per ton. The latter includes 500 tons at $4.25 per ton,purchased when there appeared to be a shortage of coal. The coal in 1902 is particularly poor, being dirty and very fine,and an increased amount was consumed per mile.

Pounds of coal consumed per engine mile was as follows:

	1902	1901	1900	1899
Passenger	49.64	48.66	48.17	49.91
Freight	123.56	111.70	110.99	107.38
Switching	95.59	80.34	85.56	98.27
Work	104.00			

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Progressive statement of repairs to engines, per engine and per mile, since road was opened, for L.S.& I. engines proper, is as follows:

REPAIRS ENGINES.

	Per Engine	L.S.& I. Miles	On Foreign Roads	Total	Per Mile (cents)
1896	$ 46.96	27,472	None	27,472	1.71
1897	338.52	111,699	None	111,699	3.04
1898	573.37	112,158	39,873	152,031	4.89
1899	536.18	153,435	70,613	224,048	3.35
1900	382.10	178,651	41,680	220,331	2.43
1901	637.93	197,341	9,659	207,000	4.31
1902	516.69	188,565	48,261	236,826	3.05

M.& S.E. engines 31 and 32 were given general repairs, the latter having new fire box.

Munising Ry. engine 24 was also given general repairs as well as their four other engines having repairs made in our shop.

L.S.& I. engines 5, 6 and 7 were given general repairs.

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W.G.M.#8

PASSENGER CAR REPAIRS.

Total cost - $112.34 - a decrease over 1901 of $487.75.

Progressive statement of repairs to passenger cars, per car and per mile, since road was opened, is as follows:

REPAIRS PASSENGER CARS.

	Per Car	Per Mile (cents)
1896	None	
1897	None	
1898	$ 59.80	.46
1899	22.71	.40
1900	83.38	1.61
1901	150.02	3.22
1902	28.09	.47

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W.H.M.#9

REPAIRS FREIGHT CARS.

Total cost for the year - $9849.29, an increase over 1901 of $3489.28

Repairs to foreign cars - $250.81, account of accident in 1901 at Ishpeming, leaving net repairs to L.S.& I.cars - $9598.48.

Cost per mile for L.S.& I.cars - .45 cents, or an increase per mile over 1901 of .11 cents.

Cost per car for L.S.& I.cars - $18.67, an increase over 1901 of $6.30.

Repairs to wooden ore cars increased or $6.72 per car	$2684.31
Repairs to Steel ore cars increased or $2.26 per car	203.75
Repairs to Cabooses and gondola cars increased or $14.61 per car	350.41
Repairs to foreign cars, caused by accident, Ishpeming, November, 1901.	250.81
Total	$3489.28

The increasing age of freight cars is the principle item of increase in the repairs. 249 wheels were removed during the year, for the following defects Seamy tread, 73; shelled tread, 1; Broken, 23; cracked, 13; worn tread, 14; worn flange, 104; slid flat, 21; The total number removed is an increase of 35 over 1901.

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There were also heavy repairs to bodies of wooden cars,from damage arising from coarse,hard ore.

Increase in repairs caused by accidents was $740.00,caused by accident on C.& N.W.tracks at Ishpeming in November,1901,and by accident ,one half mile east of Queen Mine in June,1902.

The total expense is divided as follows:

	L.S.& I. Wooden Ore 400	Per Car	L.S.& I. Steel Ore 90	Per Car	L.S.& I. Other Freight 24	Per Car	Foreign Cars
Bodies	1039.22	2.60	18.16	.20	163.60	6.81	
Draft Rigging	210.43	.53	10.63	.12	1.28	.05	
Drawbars	316.02	.79	283.62	3.15			
Knuckles	171.68	.43	17.33	.19	17.90	.75	
Trucks	2524.39	6.31	145.31	1.61	31.56	1.31	
Air Brakes	1299.64	3.25	455.30	5.06	43.84	1.83	
	5561.38	13.91	930.35	10.33	258.18	10.75	
Inspection	787.78	1.97	142.09	1.58	24.17	1.01	8.53
Accident Reprs.	656.09	1.64	142.61	1.58	170.82	7.12	242.28
Shop Expense	734.02	1.83	131.04	1.46	59.95	2.50	
Total-1902	$7739.27	19.35	$1346.09	14.95	$513.12	21.38	250.81
Total 1901	5054.96	12.63	1142.34	12.69	162.71	6.77	None
Increase	2684.31	6.72	203.75	2.26	350.41	14.61	250.81

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Progressive statement of repairs to freight cars,per car and per mile,since road was opened,is as follows:

REPAIRS FREIGHT CARS.

	Wooden - 424			Steel - 90		
	Per Car	Per Mile -cents-	Average Miles	Per Car	Per Mile -cents-	Average Miles
1896	2.08	.18	1184	None	None	
1897	10.41	.31	3538	None	None	
1898	11.24	.33	3478	None	None	
1899	10.68	.28	3825	Not kept separately		
1900	13.09	.37	3506	11.08	.33	3328
1901	12.30	.33	3667	12.69	.37	3434
1902	19.46	.47	4163	14.69	.39	3823

Under head of Improvement,there has been charged to Maintenance of Equipment,the following items:

Repairs and Renewal Locomotives - Engines 12,13 and 14		$9258.11
Repairs and Renewal Work Cars - Pile Driver	1856.52	
Snow Plow	201.46	2057.98
		$11316.09

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MAINTENANCE OF WAY - Including Structures.

Total Maintenance of Way Expenses are $41539.50, an increase over 1901 of $20289.65.

Charges to Improvement Account, transferred to the proper head under Maintenance of Way, are as follows:

Repairs Roadway- Veneer Mill Siding, Presque Isle			$545.75
Renewal of Rails - Changing Rails			4588.63
Repairs and Renewals of Buildings- Coal Storage		6726.69	
Presque Isle Turntable		145.06	
Electric Light & Pump Stn.		1665.69	
Presque Isle Water Station		93.00	
Ishpeming Water Tank		1108.95	
Ishpeming Round House		2488.35	
Ishpeming Freight House		1455.01	
Negaunee Freight House		1470.15	15152.90
			$20287.28

1.6 miles of 80 lb. rail or 200 tons new second class rail was laid in main line and sidings to replace old 60 lb. rail. There will be a further credit for the old rail taken out of about $2000.oo, leaving the net charge for the new rail laid about $2600.oo. There will be further changes in 1903 and the above credit given at that time.

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W.G.M.#13.

Repairs and Renewals of Bridges and Culverts.

Charge to the above account was $1338.53,a decrease from 1901 of $224.18,caused by less repairs being needed. The principal repairs were to bridges 3,6,10,11 and 13,in all cases to foundations,replacing norway piles with timber.

Repairs and Renewals Fences, etc.

Charge to the above account was $407.63,an increase over 1901 of $315.73,which covers cost of new snow fence built along main line at Eagle Mills and Foster. In both these places,we had much trouble last winter from drifts and these fences have entirely remedied the difficulty.

Repairs and Renewals of Buildings and Fixtures.

Charge to the above account is $1396.91,an increase over 1901 of $392.06,which includes $123.48 repairs on Presque Isle round house in addition to other ordinary repairs.

Repairs and Renewals of Docks and Wharves.

The charge to the above account is $7305.46,an increase over 1901 of $3469.60. The increase in this account was occasioned largely by extensive repairs to fender and crib made necessary by the storms in the fall of 1901, referred to in last annual report. The top of the dock,especially hard ore pockets,required more than usual repairs,owing to wear from coarse hard ore shipped. The charge also includes $885.52,paid for linings for spouts to be

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applied in 1903.

Repairs were divided as follows:

Pockets and Top.

Labor	Material	Total
$1360.01	$1642.04	$3002.05

Fender.

1022.04	2684.46	3706.50

Water pipe, steam and water hose	596.91
	$7305.46

Removal Snow and Ice.

Total charge $1378.48, an increase over 1901 of $999.38, caused principally by keeping road open entire winter and heavy snows, especially fore part of the winter.

Repairs Roadway.

Total charge to thiss account was $9326.04, an increase over 1901 of $941.19, caused as follows:

Labor, Main Line Tracks	$438.00
Material - Sidings	218.00
Crossover - Presque Isle Yard	362.00
	$1018.00