AGENTS' ANNUAL REPORTS AND STATISTICS

YEAR ENDING NOV. 30,

1906

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AGENT'S ANNUAL REPORT AND STATISTICS

FOR YEAR ENDING

NOVEMBER 30TH, 1906

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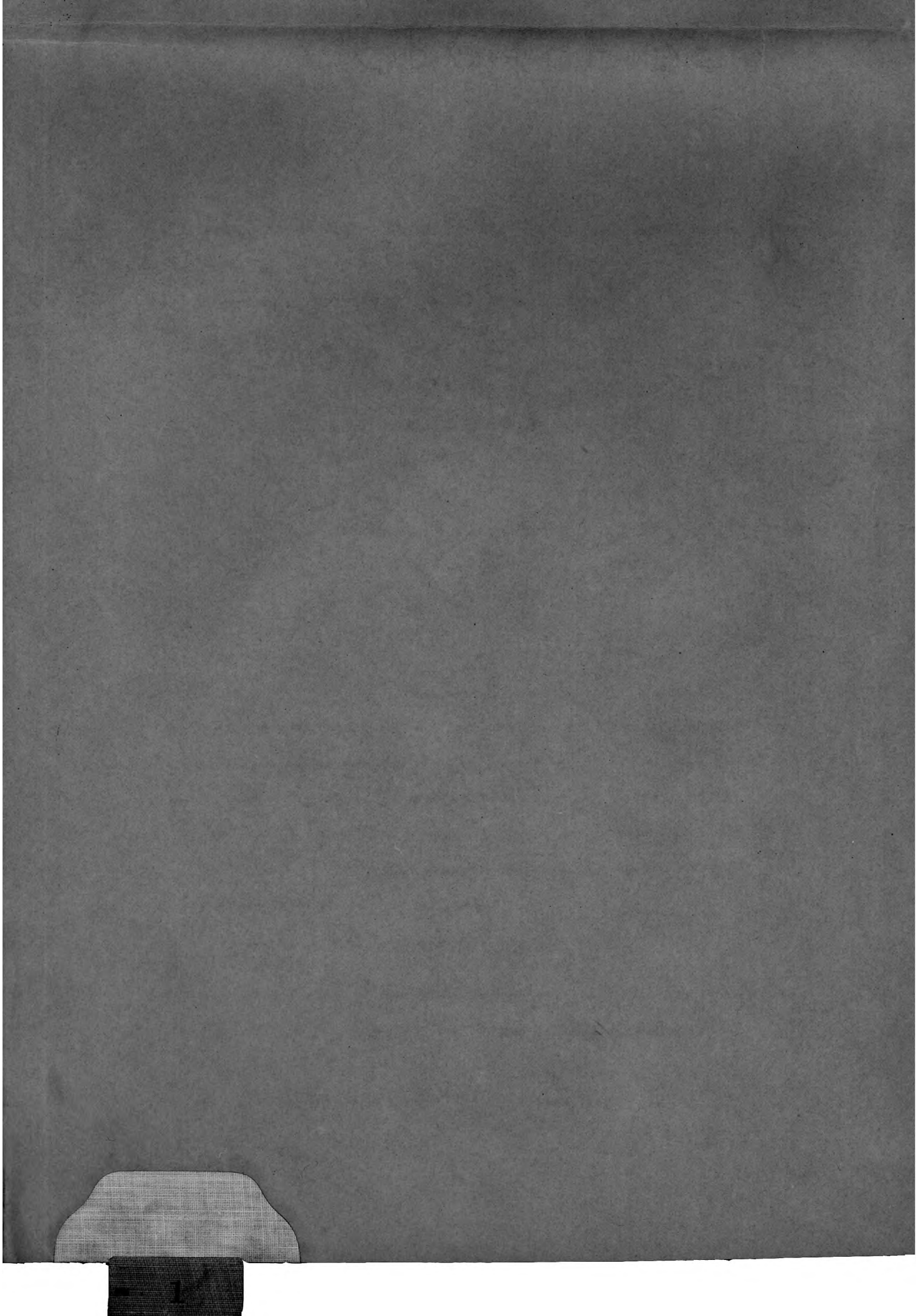


Cambridge, Mass.,

April 10, 1907.

W.G. Mather, Esq.,

President Cleveland Cliffs Iron Co.,

Cleveland, Ohio.

Ack

My dear Sir,-

The following is my report for the year 1906. This report which is to be regarded as supplementing that made by Mr. Jopling on the operations of the Engineering and Geological Departments, touches on the following topics:

I. THE HARD ORE TERRITORY.

II. THE SWANZY DISTRICT.

III. THE IRON BELT EXPLORATION.

IV. THE SUNDAY LAKE EXPLORATION.

V. THE NEGAUNEE SITUATION.

VI. DISTURBANCE OF THE SURFACE PRODUCED BY UNDERGROUND CAVING.

THE HARD ORE TERRITORY.

During the past year a great deal of attention has been given to the hard ore territory of the Ishpeming basin and a number of holes has been drilled underground in the Cliffs Shaft and Moro Mines, as well as from the surface. The Lake Superior Iron Company also have drilled several vertical holes in this area, the results of which have been at our disposal. These exploratory holes as well as the underground development have served to render more definite and precise our ideas of the geological conditions in this basin, and to indicate the direction along which further exploration and opening should proceed.

(a) Geological Structure.

The result of the work of the last year as well as that of preceeding years has been to confirm the broad conclusions as to the geological structure of the Cliffs Shaft and Moro Mines which were presented in my reports of 1902 and 1903. These conclusions together with the results of more recent work may be stated briefly as follows:

1. A synclinal axis runs through "B" shaft and passing south of "A" shaft continues to the east probably a little to the south of the Saw Mill Pit. From a crest a little west of "B" shaft this axis pitches on the one side towards the northwest and on the other towards the southeast, so that the hard ore formation in the

middle of the trough descends in both directions, towards the southeast as well as towards the northwest. The deepest point along the axis in the territory east of "A" shaft is probably in the neighborhood of the hole recently drilled near the corner of 2nd St., and Cleveland Avenue which we commonly refer to as the Braastad Hole. From here the hard ore formation along the axis rises again towards the east, reaching the surface at the Saw Mill Pit. This synclinal trough, which is a broad and open one, may be referred to as the Cliffs Shaft syncline.

2.. South of this synclinal axis and parallel with it is an anticlinal area. This is a low and warped fold, the axial line of which runs from the railway crossing south of the Hard-Ore office towards the northwest, passing some 500 feet south of "B" shaft. West of "B" shaft this axis bends first towards the west, and then towards the southwest and the dip of the beds on its northern side steepens. East of "B" shaft, this anticline like the Cliffs Shaft syncline descends towards the east probably to about the line of 2nd Street. From here eastward it ascends to the surface.

In the Moro territory this anticlinal area is opened on the 3rd, 6th, and 8th levels. It is a warped sheet with small folds and faults, as a whole descending towards the northwest at gentle angles of dip. We may call this anticline which forms the southern boundary of the Cliffs Shaft syncline, the Moro anticline.

3. South of the Moro anticline is the sharp and deep synclinal fold which has yielded the principal part of the ore of the Moro Mine. It passes out of our territory into that of the Lake Superior Iron Company at the North and South $\frac{1}{4}$ line of Section 10, which it crosses about 500 feet north of the centre of the section. This fold we may call the Moro syncline.

4. Through the northern portion of the Cliff Shaft workings runs an East and West fault which is probably the same as a fault having the same direction, which may be seen at the surface at the eastern end of the Incline open-pit. The displacement along this line is of considerable magnitude, with the downthrow on its northern side. It is perhaps the same as the Blue fault, with which it stands in fairly close alignment. North of it lies a depressed block of hard ore- formation of which we possess only a comparatively narrow strip along and south of the north line of Section 10, between the workings of "A" Shaft and the Incline Mine. This strip has been opened on the first and second levels, but as yet is an untouched resource on the lower levels, where, however, it requires long drifts in the foot-wall for its development. This fault is a most important structural feature which must be taken into account in the future extension of the Cliffs Shaft Mine towards the east.

5. The hard ore formation in Section 10, south of the Moro, terminates against greenstone the contact with which is faulted. This fault is one of great throw. Its course is easily traceable across Section 10 into Section 9 on the west, and towqrds the east well into Section 11. It is possibly the same fault as that which forms the southern boundary of the basin next south of the Blue Basin in Section 8 at Negaunee.

(b). Exploration and Development in the Hard Ore Territory.

Exploration and development in the hard-ore mines present much more difficult problems than in the soft-ore mines for the following reasons:

(1) The original deposition of the ore has in most cases no relation to the present geological structure. In this respect the hard ores differ from the soft ores which are always found in synclines or other basins.

(2). The hard ore deposits have no constant footwall and their lower limits are extremely irregular.

(3). Although the quartzite of the hanging wall, or rather the slate and conglomerate beds immediately below it, forms always an upward limit, beyond which hard ore does not extend and although conglomerate ore is almost always found at this contact, yet steel ore of high grade may occur quite far below it and to this therefore the hanging is by no means an infallible guide. A section of the iron formation from 100 feet to 200 feet thick, lying immediately below the quartzite and following all its bends would include practically all the hard ore in the Ishpeming basin: and it is possible for ore to occur almost anywhere within this distance from the hanging.

(4). Although generally regular the hanging wall in practice has proved often difficult to follow because the bedding of the underlying jasper is usually not parallel with that of the slate and quartzite and the miner is apt to be misled by it.

(5) Finally there are many minor faults and folds, and also many altered dikes the material of which is extremely difficult to distinguish from the sedimentary slates.

The fundamental principles of exploration in the hard-ore territory are to keep all exploratory drifts in close touch with the hanging; and to carry all cross-cut drill holes through either to the hanging wall slates on the one hand, or to the sideritic chert on the other and to continue them as long as they are in the hard-ore formation.

(c) Exploratory Work at the Cliffs Shaft.

"A" SHAFT. At "A" Shaft the most important development of the year was in con-

nection with the large deposit of ore in the bottom of the trough. Our drill holes have clearly proved that this continues to the 7th level undiminished in size. The same deposit has also been proved to extend above the 5th level near "A" Shaft, and it is now quite probable that it will connect to the west with the large deposit at "M" drill hole which is now being worked above the 3rd level. This will give a considerable tonnage of new ore between the 3rd and 5th levels near "A" Shaft.

On the fourth level a horizontal drill hole to the south has found ore on the southern limb of the Cliffs Shaft syncline, about 250 feet east of "A" Shaft. This together with the holes drilled in the same territory on the 1st level, indicates that the anticlinal area south of the Cliffs Shaft syncline is likely to yield a large quantity of ore. Except on its southern limb near "B" Shaft this area is as yet untouched. The faulted strip north of the Blue fault has been penetrated by a drill hole on the fourth level. It has also been opened to some extent by drift stopes and drifts on the 2nd, 3rd, and 5th levels. These explorations have found ore and make it probable that a considerable deposit will be found under this strip northeast of "A" Shaft, extending along and probably into the Lake Superior Mining Company's territory, in the SE ¼ of the SW ¼ of Sec. 3.

"B" SHAFT. The explorations and developments of the past year have found a good deal of new ore in the territory tributary to "B" Shaft.

On the south side of the Cliffs Shaft synclinal, the drift stopes on the 3rd level have been continued in ore during the year, and are now more than 1200' southwest of the shaft. Ore belonging to the same body has been found on the fourth and fifth levels, and is being drifted for, but is not yet found on the second. This deposit promises to be a large one.

In the bottom of the basin west of "B" Shaft, the ground is very much disturbed and it is extremely difficult on account of the numerous faults, most of them of small throw, to work out the geological structure with sufficient accuracy to be helpful in drifting. The ore occurs in irregular bodies of moderate size. The levels are so close together that the developments on one are a generally reliable guide for that below, and it is probable that no ore of importance has remained undiscovered in this territory. On the north side of the Cliffs Shaft syncline the hanging wall is less disturbed than on the south side, and the dip also is more gentle. Three vertical holes from the surface were completed in this territory during 1906 and a fourth was started which was finished in February of this year. Of these holes Nos. 3 and 4 found ore in advance of the underground development. Holes 1 and 5 both entered sheared diorite at the hard ore horizon, and were therefore blank.

It seems to me probable that this diorite is dike rock in both cases, and that iron ore may exist in the neighborhood of both holes.

(d). Future Explorations.

The various ore bodies east of "A" Shaft may be expected to continue eastward with the usual interruptions and lean spots. The two important general questions in connection with their development are: (1) the depth of the basin in this direction; and (2) how much of the territory may profitably be developed from the Moro or from some other shaft. It is indispensable to know the depth of the basin because this will fix the ultimate depth of "A" Shaft, and that of the lowest level to be opened from it. The Braastad hole shows ore to the 10th level, and it will probably be necessary to drill other holes in order to discover whether there is yet ore below this.

Beyond the bottom of the basin towards the east the ore-bearing territory lies very far from "A" Shaft and to get into it from that side would require a long extension of the upper levels through barren rocks. We hope that it may be possible to open at least part of this ground from the Moro side, with less rock drifting, or as regards part of it perhaps even to find a connection in ore most of the way. An important part of our exploratory work in the immediate future will be directed to the settlement of these questions.

In Section 3 we have a corner in the SW ¼ of the SE ¼ which should contain the western prolongation of the hard ore formation of the New York Mine. A hole will be drilled south of the old High School Building in the Excelsior second addition to test this ground.

Although the hard-ore territory lying east of "A" Shaft and tributary to it is quite large, its limits are fixed on all sides by the workings of other mines or by our land boundaries. The great possibilities of the future are west of "B" Shaft. While the two holes, which are farthest west, failed to find ore this fact should not discourage us from continuing our drilling in this direction. On the contrary I confidently anticipate favorable results and the discovery of large amounts of ore in this area. The drifts on the south side of the trough should be pushed ahead, and drilling should be started in the NW ¼ of the NE ¼ of Section 9. The hard ore formation should also be explored northwest of holes three and four.

(e). Exploratory work at the Moro Mine.

The new ore found during 1906 at the Moro lies in the anticlinal area

already described, within this this on the 3rd and 8th levels a considerable tonnage has been developed and mined.

The exploration of this portion of the mine by the drill is peculiarly difficult not only because the ore is thin and interrupted, but also because the formation is, on the whole, so flat that it is impossible to get stations underground from which it may be crosscut except at very acute angles. Hence the drill may pass close above or below ore without disclosing it.

The mining problem in this territory is equally dificult for the same reason, namely, the general flatness combined with minor irregularity of the dip. On this account it is extremely difficult to follow the ore with drift stopes as well as to mine the floors between levels without drifting in rock. Our explorations indicate that but little of the anticlinal area is likely to be productive below the 8th level, that is to say, the ore formation appears to cross our boundary into the Lake Superior ground for the most part at or above this elevation. It is hoped, however, that with some rock drifting to the north we may be able to get our ore connection on the 8th level through to the eastern end of the Cliffs Shaft basin. The exploration of the anticlinal area, therefore, is the most important work before us at the Moro.

(f) Underground Development.

Am important matter, which was taken up with Mr. Graff during the summer, and frequently discussed, was the question of the possible modification of the present method of mining in the two hard ore mines, and especially in the Cliffs Shaft.

Our present system is to develop ore discovered by the diamond drill by carrying wide and high breast stopes through it. This system is very satisfactory from the mining standpoint, because it yields a product at a low cost per ton. From the point of development, however, it has three great defects, namely; (1) the openings are extended very slowly; (2) too large a proportion (about 60%) of the product is taken on the advance, and too small a proportion left behind as reserve; and (3) when a stope runs into rock it is necessarily discontinued and further development along that line usually ceases.

It was felt that on the lower levels, which on account of the distance of the ore from the shafts, take so long to develop, it would be desirable to cut down the size of the breast stopes and therefore advance them more rapidly, and leave behind a larger reserve. In association with Mr. Graff a plan embodying this principle was outlined which it is hoped will soon add largely to the developed ore in the mine, without ultimately increasing the cost per ton.

THE SWANZY DISTRICT.

During the past year our explorations in the Swanzy district have been vigorously prosecuted and have been directed to the following principal objects: (1). The determination of the value of the D.M. and M. lands which involved the exploration of the western and southern boundaries of the Swanzy basin; and (2) the determination of the extension and limits of the ore-bodies already discovered.

The details of the location of the holes and their results are familiar to you from the reports of this department and of Mr. Jackson. In the following statement I shall confine myself to a more general consideration of the objects aimed at, and the extent to which they have been attained, together with the bearing which the results have on our future work in this district.

(A). The D.M. & M. Lands.

The D.M. & M. Company own a large acreage of swamp lands in T 44 N R, 24 and 25 W in the direct prolongation of the Swanzy basin, as its boundaries were known a year ago. Since our hold on these lands was slender and without definite term, it seemed imperative in view of their possibilities, to discover as soon as possible the continuation and boundaries of the basin towards the southeast. With these requirements in view, it was felt to be expedient to push on to points as near the large blocks of D. M. and M. lands as possible. Accordingly, in the autumn of 1905, drilling was started on the north and south sides of the trough at points over a mile in advance of its boundaries as previously located. These boundaries are indicated in red on the accompanying map.

(a). Work on the Continuation of the northern side of the Basin.

The first holes drilled on the continuation of the northern boundary of the basin were in Section 36, 45-25; they were followed by others farther south in Sections 1 and 12, 44-25, so placed as to spread a net across the path of the basin of a mesh too fine to permit it to pass through unobserved. But all encountered granitic or other Archaean rocks under the sand or sandstone.

Work in this territory has been very slow and expensive, partly on account of its remoteness from our base at Princeton, but mainly on account of its swampy character, which made it almost impassable during the summer season to move the drills to the critical points of the area. Also since the first holes encountered granite we had to move back to the Swanzy series with short and necessarily uncertain steps in order to avoid getting too far and thereby incurring the expense of drilling deep holes in the slate. The original plan made in the autumn of 1905 was to

push the work vigorously after the swamps had frozen, but unfortunately the winter proved to be unusually mild, and the swamps remained impassable throughout the season. In the summer we decided to construct corduroy roads across the swamps in order to reach certain indispensable points in Sections 2 and 3. The series of holes planned in these sections is not yet completed, but enough has been done to make it fairly certain that the Swanzy basin comes to an end by the convergence of its northeastern and southwestern sides somewhere near the northwestern corner of Section 1, 44-25. We do not yet possess sufficient data for drawing the boundaries accurately: it seems fairly certain, however, that he D.M. & M. lands within the basin, and which therefore possess chances of iron ore will be five forties in the southern half of Section 35, 45-25, one forty in Section 3, 44-25, two forties in Section 4, 44-25, one forty in Section 32, 44-25, and eleven forties in Section 33, 44-25, or in all twenty forties.

(b). Chances for Ore on the D.M. &M. Lands.

SECTION 35. The only holes on D.M. &M lands on which ore has as yet been found are holes 4 and 12, Section 35. Hole 4 is on the south line of the section in the SW $\frac{1}{4}$ of the SE $\frac{1}{4}$; it encountered 18 feet of ore 1500 feet below the surface, being the deepest hole in the Swanzy district. The ore is of good quality, running 58% metallic iron. This hole is equally significant for the adjoining land in Sec. 2, 44-25 which belongs to the Northwestern Company.

Hole 12 is in the N$\frac{1}{2}$ of the SE $\frac{1}{4}$ of Section 35 on the line between the two forties, both of which belong to the D.M. & M. Co. The ore in this hole is mixed and of low grade. It is promising mainly because it may indicate the proximity of richer ore. Three other holes drilled in these 40's, namely, 7, 8, and 9 have, however, failed to find ore.

The ore found in Hole 4 belongs to a body, which will undoubtedly mount high towards the surface, but as yet we do not know in what direction. It seems most probable that its continuation will be towards holes 11, 13, 14, 15, and 16 on the adjoining forty on the east, which belongs to the Northwestern Company. If so, the SW $\frac{1}{4}$ of the SE $\frac{1}{4}$ may contain a deposit of large size. But until we have drilled additional holes no estimate of the amount of ore can be made.

SECTION 35. S$\frac{1}{2}$ SW$\frac{1}{4}$. No holes have been drilled on these lands as yet. The iron formation under them may lie too deep for oxidation and concentration.

SECTION 3. NE $\frac{1}{4}$ NW$\frac{1}{4}$. This forty has not been drilled but we have located

a hole at the north ¼ post of the section to which a drill will soon be moved. This will be a union hole as regards the adjacent forties, which bleong to the I. Stephenson Co., and to the Northwestern Company respectively

SECTION 4. N ½ NW¼. Our drill holes have shown that these forties carry the iron formation only in a narrow fringe and to a shallow depth. Its character and thickness as shown in these holes were not encouraging.

SECTION 33. The eleven forties which the D.M & M. Co., own in this section are all underlain by the iron formation, for the most part at considerable depth. One hole in the SW ¼ of the NE ¼ on D.M. & M. lands, which was drilled several years ago, found the iron formation thin and unoxidized at a depth of feet. Although the territory is practically virgin, it should be said that holes on Northwestern lands in the SW ¼ of the SW ¼ and on the nearest portions of Section 27 have found the formation of generally unpromising character. The best chances would seem to lie in the two western and in the three southern forties, and these will be explored as soon as possible.

SECTION 32. Lots 4 and 5. These lots probably contain the iron formation. The holes drilled on the SW ¼ of the SW ¼ of Section 33 do not indicate that it has much promise.

Altogether our explorations indicate that we are likely to have at least one deposit of workable size and quality on the D.M. & M. lands in Section 35.

(c) Work for the future on the D.M. & M. lands.

As just indicated the work for the future may be summed up as follows:

(1). The further exploration of the ore shown by holes 4 and 12, Section 35.

(2). The exploration of the lands in the north half of Section 3, 44-25.

(3). The exploration of the lands in Sections 32 and 33, 44-25. The drill now at work in Section 29 is approaching this territory, and, as soon as it is free, will be located on lot 4, Section 32, east of the river. If the formation here proves favorable, the adjacent portions of Section 33 may be investigated by a second drill as soon as one is free.

B. Other Work in the Swanzy District.

(a). Extensions of deposits already known.

During the year drilling has been in progress on Sections 19, 27, 28, and 29, in order to follow and define more closely the limits of ore previously known to exist. The results of this work are as follows.

SECTION 19. On Section 19 on the northwest quarter near the old Princeton Mine, several holes have been drilled from the surface proving the existence of about 125,000 tons of ore of merchantable grade. This ore is a part of the old Princeton deposit.

SECTION 27. In the SE ¼ SE ¼ several holes have been drilled in the endeavor to trace the continuation of the ore found in hole 10, but without success. A large area in this forty is underlain by ore, but it is thin and the deposit is of doubtful value.

West of Johnson Lake several standpipes have been sunk and shallow holes drilled about the northern border of the ore body. Some of these have found ore.

SECTION 28. On Section 28 standpiping, in order to find a practicable site for a shaft, has been going on at the Smith and exploration for ore at the Kidder. At the latter we have found a body of ore of workable size and quality. Exploration has not yet been completed, but by the end of the year, we had proved the existence of 400,000 to 500,000 tons.

SECTION 29. A number of holes were drilled on this section south of the Stephenson to follow up that deposit. As a result we have demonstrated the existence of about 250,000 tons of ore in a long and narrow deposit. This portion of Section 29 is covered with a very deep mantle of sand, making the exploitation of this ore from a separate shaft a slow and very costly operation. The ore ought to be mined from the Stephenson side.

The Work at Helena.

In addition to the exploratory work on Section 1 and 12, a drill was employed during part of the summer on D.M. & M. lands along the Northwestern Railway. Three holes were located across the prolongation of the line of the Swanzy basin, in order to see whether the basin continued to the southeast, but all encountered granite

under the Cambrian sandstone. The line of the railway was chosen for this section because, as already explained, it was the only line of transportation available across this Swampy area.

III. THE IRON BELT EXPLORATIONS.

In August 1905, I recommended that the Iron Belt property should be taken under option and in September of the same year, a plan for beginning explorations at this locality was outlined by Mr. Jopling and myself, and soon after put into effect. The geological conditions at the Iron Belt, and the complete scheme of exploration of which the plan just mentioned formed a part are set forth below.

The Iron Belt property includes eight forties in Section 11 T 45 N R 1 E Wisc; namely, the NE ¼, the S½ SE ¼ NW ¼, the NE ¼ SW ¼, and the W½ SW ¼. The range crosses the section diagonally from southwest to northeast, so that the Iron Belt possesses approximately 6000 feet in length of the outcrop of the iron formation. This length is divided into two nearly equal portions by a cross fault west of No. 7 shaft. The length of the eastern block from the fault to the Atlantic line is about 2800 feet; while the length of the western block from the fault to the Shores line is about 3200 feet. These two blocks, the eastern and the western, have to be treated as entirely separate problems from the point of exploration, for the reason that along the fault, which divides them, the horizontal displacement appears to be 130 feet, corresponding to a vertical displacement many times as great, and involving a complete break in conditions.

Moreover, each of thes blocks is itself divided into two separate fields for exploration by a longitudinal band of black slates, which run through the property parallel with the footwall quartzite and some 150 to 200 feet above it. These slates lie in the great longitudinal fault of the Gogebic range. They form the hanging wall of the lower ore zone of which the quartzite constitutes the foot. They also form the footwall of the upper ore zone. The two blocks, each of which has two ore zones, rendered quite independent of one another by the longitudinal fault, therefore afford in all four individual fields in which ore may occur and in which its occurrence is to be investigated.

The large deposit already found at the Iron Belt, from which its product has mainly come, occurs in the upper zone of the east block on a dike pitching east about 15° into the Atlantic territory. The only other ore found occurred in a very irregular deposit along the cross fault already mentioned. The lower zone in the western block had been somewhat explored by No. 6 shaft near the Shores line. Besides these openings, a good many shallow diamond drill holes had been drilled both underground and from surface. In carefully taking into account this previous work it seemed that the upper ore horizon in the east block, (which had already yielded a large amount of ore), could not be drilled to advantage, and might be regarded for the present as sufficiently explored. Also as regards the lower horizon in the east block, it seemed better to wait until the mine was pumped out before attempting exploration in depth. This left the western block on which to begin operations.

The plan adopted contained, as its essential features, the following:

(1). The holes were to be located near the respective footwalls and were to be drilled parallel with the dip of the formation.

(2). The holes were to be placed in each zone in such positions that (having in mind the prevalent pitch of the dikes towards the east at an angle of 15°) when completed the property would be completely explored down to depths ranging from 1500 feet near the Shores line to about 2400 feet at the cross fault.

In order to attain this result the full number of holes planned and their depths are as follows:

WESTERN BLOCK.

(1). Footwall Zone.

Hole	Location	Dip	Depth
No. 101	200 feet NE No. 6 shaft	70°	1500'
No. 102	about 200 feet E No. 40 Diamond Drill hole	70°	700'
No. 103	50' SW No. 5 Shaft boiler-house	70°	1000'

(2). Hanging-wall zone.

No. 201	250 feet north No. 6 shaft	70°	1500'

No. 202 200 feet north No. 103

70° 900'

Diamond Drill hole

Total 5600'

EASTERN BLOCK.

Footwall zone.

		Location	Depth
(1)	No. 104	SE No. 1 shaft 40' from foot	1500'

In addition it was planned (1) to test-pit along the footwall near the cross fault, and,, when the mine should be pumped out, (2) to crosscut on the fourth level, at No. 1 shaft, south to the quartzite, and (3) to sink No. 1 shaft deeper.

Of the general plan of exploration sketched above the following portions have been or are being carried out.

(1). Hole 201 was drilled to a depth of 1573 feet. For practically the whole distance it was in well oxidized and promising iron formation, but no rich ore was found. No important dike was encountered.

(2). Hole 101 was not started in the proper direction and consequently entered the footwall at a depth of 550 feet. It was continued to 946 feet in the hope that its dip might flatten sufficiently to carry it again into the iron formation. No important dike was encountered in this hole.

(3). Hole 103 has been started and is now going down.

(4). The surface test-pitting in the eastern block near the cross-fault failed to find ore.

While our work has so far not found ore, I think our chances are still sufficeintly good to justify its continuation along the lines indicated.

IV. THE SUNDAY LAKE EXPLORATIONS.

In the autumn of 1905, we took options in the vicinity of Sunday Lake on two blocks of land, one comprising the western six forties of the south half section 8, T 47 N R 45 W, and the other the whole of Section 17. Both these areas were explored during the winter of 1905 -06, and the following spring.

SECTION 8 T 47 N R 45 W. Our exploration on Section 8 were continued to nearly the first of June, 1906, and were without result. They showed that a cross fault follows close to the west line of Section 8; and that the quartzite, which forms the Mikado footwall, has been heaved towards the north on the eastern side of this fault, almost to the east and west quarter line of the section. Only a narrow fringe of the iron formation therefore is included within the property which we were exploring. If any ore should occur on this land it would pass at a moderate depth to the property of the Steel Corporation on the north. Our explorationswere therefore discontinued.

SECTION 17 T 47 N R 45 W. In the northern portion of Section 17 the iron formation extends probably entirely across the section from east to west. To the east at the Penton exploration the material in the dump is of promising character. The same is true of the Pilgrim exploration in Section 18 to the west. These facts attracted us to this field.

Our drilling showed that on Section 17 the iron formation was shallow, thin, and generally unpromising. The exploration therefore was discontinued.

V. THE NEGAUNEE SITUATION.

During the year a great deal of attention has been given to the drilling at the Negaunee Mine, and on the Harvey lots; and to the general problems of development and mining at Negaunee. These subjects have been treated fully in a special report made to Mr. Duncan on Oct. 30, 1906, and no further reference need be made to them here.

VI. DISTURBANCE OF THE SURFACE PRODUCED BY MINING ON THE CAVING SYSTEM.

In planning new development work, and locating shafts, buildings, stock-piles, and tracks, we are constantly meeting the problem of the limits of the disturbance likely to be produced at the surface by mining ore on the caving system. This question is one that cannot be settled by deductions from general principles. It is one, however, with which this Company has had a large amount of experience at its Lake and Salisbury Mines. During the past summer a good deal of time was spent in getting together the facts at these mines, and putting them in a form in which they will be useful This work may profitably be extended in the future to all the mines of soft ore in which we have an interest. When this is done we shall be able to deal with similar problems with confidence firmly based on experience.

Yours truly,

H. A. Wyatt

James H. Hoyt
Alton C. Dustin
Hermon A. Kelley
Homer H. McKeehan
Horace Andrews
Gustav von den Steinen
Walter C. Merrick
William B. Stewart
George W. Cottrell
Julian W. Tyler

Law Offices of
Hoyt, Dustin & Kelley,
Western Reserve Building,
Rooms 701-723
Cleveland, O. April 9, 1907.

The Cleveland-Cliffs Iron Company,
Rockefeller Building,
City.

Gentlemen:-

REPORT OF WORK DONE DURING THE YEAR 1906.

-o-

The firm of Hoyt, Dustin & Kelley has, at your request, transacted business in connection with numerous matters during the year 1906, and as to those transactions and cases we beg to report as follows:

ITASCA CASE:

The case of The Cleveland-Cliffs Iron Company vs. The East Itasca Mining Company was tried some time ago in the United States Court at Duluth, Minn., where, as you are already aware, there was a decision adverse to us. The case was thereafter taken on error to the Circuit Court of Appeals at St.Louis, and in February last it was argued there. The decision of that court was also adverse to The Cleveland Cliffs Iron Company.

We have heretofore taken steps to proceed in the Supreme Court of the United States, asking for a writ of certiorari in this case, and have prepared and filed the necessary papers, including briefs, petition for writ, etc. The application for the writ of certiorari will be made to the court on Monday, April 8th. We are not able to predict as to the result in this matter, but the entire facts have been submitted to the Supreme Court by brief, under the rules of that court.

We herewith send you printed copies of our brief and petition for the writ.

PRESQUE ISLE PURCHASE:

Early in 1906, you determined to consider the purchase of the Presque Isle, lying near your Taylor farm, so-called, at Toledo. A contract was thereupon entered into with Adell M. Quaile, the owner of the land. We immediately ordered and obtained an Abstract of the property, and upon examination learned of conditions connected with the title making it necessary that proceedings be taken to quiet title before we could recommend the purchase. Thereafter such proceedings were had in the Court of Common Pleas of Lucas County, Ohio, that a decree was entered quieting the title of this property in Adell M. Quaile. Upon this being done, we completed the purchase by obtaining complete deeds from Mrs. Quaile, including all of her riparian rights, so that, so far as we are able to see, the company has received a good title to this property.

CHUTE CONTRACT- SETTLEMENT:

Prior to the beginning of 1906, you had entered into, contracts with Mr.Chute for the erection and completion of certain wood alcohol distillation apparatus at your plants in northern Michigan. During the erection of the plants, modifications of the contract were made, and it became necessary upon the completion of the work to obtain a satisfactory settlement with Mr.Chute, protecting your rights. This matter was taken up with him, and after some negotiations, a complete settlement was made, and releases of all liability to him were obtained. In the course of this settlement, your rights in connection with the apparatus, and the future construction provided for in your contract, were protected as fully as possible, considering the modification which had been made in the agreement.

IRON DUKE MINE MATTER:

Some time during the month of April, we took up with the owners of the Iron Duke Mine, the matter of acquiring by lease and otherwise, interests and rights in the real estate owned by that company, and the right to mine iron ore, if the same should be found in paying quantities, at a low rate of royalty.

The nature of this entire transaction will be shown by the papers in your files. We prepared and obtained the execution of the necessary papers, transferring and vesting in the Cleveland-Cliffs Iron Company, the rights contracted for, and, in the course of the proceeding, caused such steps and action to be taken by the stockholders and officers of the company that the contract and transfers all and singular were made properly and in legal form; all stockholders being fully advised of the steps taken, and consenting to the same in such manner as to bind not only themselves, but the corporate body.

EXAMINATION AND REPORT AS TO PROPERTY AND INTERESTS AT NEGAUNEE:

About May 19th, 1906, you requested that we arrange to go to Negaunee, Mich., and consider and report upon various matters connected with the interests of the company. On May 19th, 1906, Mr. William G. Mather wrote to Mr.Duncan, fully setting out the questions to be considered. Almost immediately thereafter Mr.Andrews, of this firm, went to Negaunee, and took up and carefully considered the various matters referred to in the letter above mentioned, and thereafter, about July 12th, 1906, made written reports relative to these subjects.

Among the matters considered and reported on, as above, were matters connected with your ownership and interests in the Maas mine; your rights in the minerals underlying certain portions of Main Street in Negaunee; your rights in connection with the race track property, and the Baldwin Hill Road; your rights and duties connected with the cemetery leases and various other matters specifically referred to in the Maas Mine report.

An opinion was also given relative to the general subjects connected with the Negaunee Mine, including the D.S.S.& A. right of way and the State Road; your duty to furnish lateral support, rights in connection with the location of shaft and other subjects there specifically referred to.

Report was also made as to the right to mine for manufacturing purposes, and relative to the rights conveyed in the deed from Reynolds to Harvey, giving in general the situation of the company, and the adverse claims now asserted by other parties relative to such rights.

Attention was also called to the present situation of the Pioneer Iron Company, and the rights of tenants in common to mine and take out the ore from underlying property.

Connected with the above opinions were maps and statements, fully illustrating the matters therein referred to.

BALDWIN HILL ROAD:

After the opinions above referred to had been furnished, the company took steps to obtain an extension of its lease, and all its rights in connection with the Baldwin Hill Road, so-called, lying next east of the race track property at Negaunee. Application was made to the council of the City of Negaunee by proper steps and proceedings, and the extension was granted; all as shown by papers and documents now on file in your office, and, since the beginning of this year the lease as so extended, was properly executed by all parties.

WOOD ALCOHOL LEGISLATION:

As you are aware, during the session of Congress in the year 1906, the matter of amending the revenue laws of the United

States removing the tax upon ethel alcohol was greatly agitated, and, as a result of this, the present law was passed removing generally such tax. In the mean time, prior to the passage of the law, attempts were made to put through adverse legislation in various of the states, including the state of Ohio. At the request of Mr.Mather, we, together with others, took up the defence of the wood alcohol interests, and rendered all assistance possible in an effort to prevent or modify this legislation. The steps taken in Ohio were entirely successful, and the proposed legislation was prevented. It was impossible, however, to prevent, or in any way modify, the proposed action by the Congress of the United States, and the present legislation was passed in spite of all efforts to the contrary.

HULL CASE:

This suit was brought in the Circuit Court of Marquette County to quiet the title of certain lands theretofore purchased by The Cleveland-Cliffs Iron Company, from the heirs of Isaac Johnson. This land, as you will remember, is situated about and near Little Lake, so-called, in Marquette County. The matters involved in this case are of importance, and every effort has been made to obtain testimony to establish the title of The Cleveland-Cliffs Iron Company to the entire property in question. The work done to this date has consisted in locating the heirs of numerous deceased persons who were interested in the property, and obtaining quit-claim deeds from them, as far as possible; looking up the evidence of the acts and doings of the parties interested in this land over forty years ago, and taking the testimony of various witnesses preparatory to the trial of the case.

Mr. William P. Belden of Ishpeming, Mich., together with our firm, has been actively engaged in all the work done, and we are now making every effort to prepare for the trial which is likely to occur in the May term, 1907.

VACATION OF BAY SHORE ROAD:

This proceeding has been instituted before the Commissioners of Lucas County, Ohio, to vacate the Bay Shore Road, so-called, which is the highway leading through your property at Toledo, which you heretofore purchased from Mrs.Stentz and Mr.Taylor. You will remember that this road crosses Duck Creek and Otter Creek by wagon bridges heretofore constructed and maintained, and if we succeed in vacating the highway, these bridges will be subject to your control.

In carrying on this proceeding, we have endeavored to obtain command of the approaches to the bridges, as well as command of these Creeks, so that you will not be hereafter hampered in any work which you desire to carry on. The petition has been presented, and all steps taken down to the final hearing which will occur at the June meeting of the County Commissioners.

THE DUNN LAND:

In connection with the vacation of the Bay Shore Road, it was found that a party by the name of Dunn owned land lying next to the Bay Shore Road, which land included a portion of the approach to the bridge across Otter Creek. The Dunn land extended from the land lying easterly of Otter Creek to the center of the creek and to the line of your Taylor farm. It was thought best that we obtain an option to purchase from the Dunns this small portion of land, thus giving you all rights to the approaches to the bridge across Otter Creek, and giving you the control of Otter Creek southerly from the land in question. A land contract was thereupon prepared and entered into, and since that time the purchase has been completed.

CORBET LOT NO. 13:

During the latter part of 1906, The Cleveland-Cliffs Iron Company carried on negotiations, which resulted in leasing from Louis Corbet, one of the Harvey lots, so-called, being known as the Corbet Lot "No. 13". The title to this lot was in a very complicated condition, and this firm gave the matter careful attention, as will be shown by the opinion furnished as to the title held by Louis Corbet.

Since the lease was executed by Mr.Corbet, steps have been taken to more thoroughly protect your position by obtaining from the former owner, Mrs.Collins, a deed for any possible interest which she has, or might assert, in the property. There is no doubt at the present time that as matters now stand, you hold at least the undivided one-half of the minerals, and it may be decided that the entire minerals under this property pass to you under your lease. As the title now stands, it will be the part of wisdom that before you enter into mining operations on this lot, you first proceed to fix your rights and quiet the title to the property against the claims heretofore, and now made, by the Arctic Iron Company.

These matters are more fully discussed in the opinion above referred to.

THE GAMBLE CASE:

This suit was brought by Henry Gamble against The Cleveland-Cliffs Iron Company, in the United States Circuit Court at Detroit. Gamble claimed commissions in connection with one of your land purchases, to the amount of about $8000.00. On the trial, the Court directed a verdict in favor of The Cleveland-Cliffs Iron Company. We are informed that the attorneys for Gamble are now preparing their papers and records, with a view to taking the case to the United States Circuit Court of Appeals at Cincinnati.

THE ARCTIC IRON COMPANY VS. THE CLEVELAND-CLIFFS IRON CO., ET AL:

As you are aware, some months ago The Arctic Iron Company began suit against The Cleveland-Cliffs Iron Company and Mr. Wm.G.Mather, asking for an accounting for all profits made by your company in connection with the lease executed to the Oliver Iron Mining Company.

This suit was removed to the Circuit Court of the United States, where it has since been pending. Under the rule of the Circuit Court of the United States, all testimony in such a suit as this is taken in writing in the form of depositions.

The parties on both sides have proceeded to take a great deal of testimony, including witnesses in various parts of the country. The testimony on both sides has been completed, with the exception of some small matters in rebuttal. The case is likely to be heard during the early summer of 1907, before Judge Knappen at Grand Rapids, Mich. This suit is of the greatest importance, and has been receiving the most careful attention at the hands of this firm, as well as Mr.William P. Belden at Ishpeming.

TIMBER HOLDINGS OF CLEVELAND-CLIFFS IRON COMPANY- LEGISLATION:

Under the law of the State of Michigan, mining and manufacturing companies are limited in their land ownership to 50,000 acres. As matters now stand, The Cleveland-Cliffs Iron Company has greatly exceeded the limit above mentioned, and this firm has at various times considered the question as to what steps should be taken to prevent complication and difficulty growing out of this land holding, and the possible adverse action upon the part of the authorities of Michigan.

We have feared that the agitations going on throughout the country, in connection with corporate holdings, might finally be taken up in Michigan, and that a crusade would be made against mining companies and other corporations relative to their holdings of the lands in the Upper Peninsula. We have, therefore, advised that no further tracts of any considerable size be acquired in the name of The Cleveland-Cliffs Iron Company, and that as soon as possible, appropriate legislation be sought removing the 50,000 acre limit.

During this present year, our fears as to agitations against corporate interests in Michigan, have been verified, and, as you are aware, legislation has been proposed, and in fact passed, ready for the Governor's signature, which would have been very dangerous for all iron and copper companies. It has only been by the most strenuous efforts upon the part of all interested corporations, that these acts have been prevented from becoming laws of Michigan. Other legislation is now threatened, and for the present, your efforts must be confined to preventing what the agitators at this time propose. The new legislation which we desire will, therefore, be postponed until another session.

THE KIRKPATRICK PURCHASE:

During the month of April, 1906, The Cleveland-Cliffs Iron Company entered into negotiations with the Pittsburgh & Lake Superior Iron Company for the purchase of an interest in certain lands in Marquette County, Michigan. Mr.Kirkpatrick represented in this negotiation the Pittsburgh & Lake Superior Iron Company. The result of the transaction was that The Cleveland-Cliffs Iron Company obtained from the Pittsburgh & Lake Superior Iron Company, a conveyance of the surface and the undivided half of the minerals of the land which was described in the deed executed about April 19th, 1906. The Cleveland-Cliffs Iron Company also obtained a mining lease of the mineral interest excepted and reserved by the Pittsburgh & Lake Superior Mining Company. These papers were recorded at Marquette, Mich., about April 23rd, 1906, and in the entire transactions at Cleveland, this firm assisted in the negotiations and the preparation of the papers.

TAX MATTER:

The only unsettled tax matter is the claim made against The Cleveland-Cliffs Iron Company. This company was put on the tax duplicate by the Auditor of Cuyahoga County for $253,443.00. An application was filed, and is still pending, before the State Auditor, for the remission of these taxes. The matter is set for hearing on April 23rd next, but it is not certain whether it will be heard at that time.

County Treasurer Madigan, also brought suit after the application was made to the State Auditor, which suit is now pending in Cuyahoga County. An answer in the form of a plea to the jurisdiction of the court has been filed, setting up the pendency of the proceedings before the State Auditor.

CLEVELAND IRON MINING COMPANY, IRON CLIFFS COMPANY AND PIONEER IRON COMPANY - TAX MATTERS:

This matter was settled for an agreed amount and paid by your company.

TROY - PETER WHITE:

A libel was filed on November 17th, 1905, against the steamer Peter White by the Western Transit Company, owner of the steamer Troy, for salvage, on account of picking up the White with a broken shaft on Lake Superior near Devil's Island, and towing her back to Duluth. The amount claimed in the libel was $50,000.00. The underwriters on the White authorized a settlement of the case for $10,000.00 which was declined by libellants, and the case was subsequently tried in the United States District Court at Buffalo, resulting in a judgment for only $5,000.00.

In addition to the foregoing, the Admiralty Department of this office has taken care of the current protests for accidents in the fleet during the past two years.

GRAND ISLAND STEAMSHIP COMPANY:

In January, 1906, we prepared the necessary papers for the transfer of all the vessels then owned by The Cleveland-Cliffs Iron Company to the Grand Island Steamship Company, for the consideration of $495,000.; said amount to be carried on the books of The Cleveland-Cliffs Iron Company against the steamship company.

We also prepared the proper papers to cause all the vessels of the Grand Island Steamship Company to be hailed from Grand Island, Mich., and for obtaining proper license for the steamship company to transact business in Michigan.

We also attended to all matters in connection with the transfer to and enrollment in the name of the Grand Island Steamship Company of the steamers J.H.Sheadle, Ishpeming and Michigan, and the preparation of the mortgages and bonds on said vessels, bearing date December 1st, 1906.

LAKE SUPERIOR & ISHPEMING RAILWAY COMPANY:

We attended to the preparation of the proper papers in connection with the redemption of bonds under the mortgage; also examined and revised report to be made to the Interstate Commerce Commission.

MARQUETTE & SOUTHEASTERN RY. CO.

We examined and revised report to be made to the Interstate Commerce Commission.

CROWN DRYER COMPANY CLAIM:

It will be remembered that, in connection with the settlement between the Crown Dryer Company and The Cleveland-Cliffs Iron Company, the latter accepted a promissory note covering the agreed amount, which was due from the former to the latter for damages. During the year 1906, the Crown Dryer Company went into bankruptcy. Subsequently a suit was brought against the stockholders of the bankrupt company, and this firm represented the claim held by The Cleveland Cliffs Iron Company. After several hearings, we succeeded in collecting the sum of $1600.00 which was reported to you.

PIONEER IRON COMPANY - DUTY ON CHARCOAL IMPORTED:

During the year the Collector of Customs collected excess duties on several shipments of charcoal from Algoma Steel Company, which excess duties we finally secured the repayment of, after petitioning the Board of General Appraisers and the Department.

JOHN SPRY LUMBER COMPANY CLAIM:

The Upper Peninsula Land Company had a claim against the John Spry Lumber Company and Mr. John C. Spry for 1905 taxes paid on certain lands covered by timber contracts held by the Spry Lumber Company. The latter company neglected to pay these taxes, and the claim was placed in our hands. The amount of the claim, including interest to June 25, 1906, was $554.40. After considerable correspondence we finally succeeded in collecting from Mr. Spry the sum of $557.09, in full of the account. This amount we sent to Mr. Merriam, and the matter is, therefore, settled.

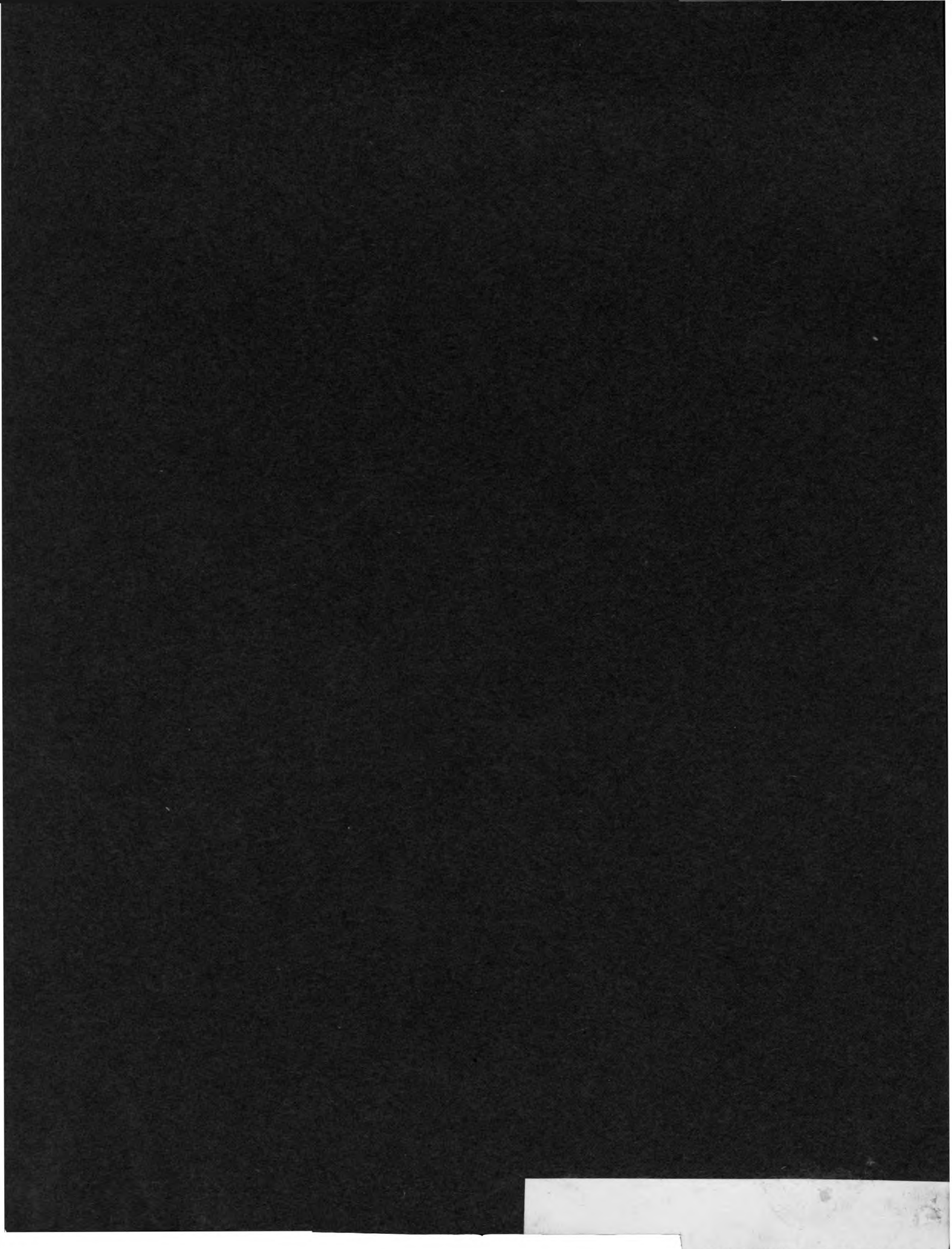
The foregoing statement is intended to cover in a general way, the more important matters which passed through this office, and received attention by various members of the firm.

In addition to the foregoing, numerous smaller matters were considered and cared for, but because of their nature are not here reported.

Very truly yours,

Byt. Dustin & Kelley

5/B.



HOYT DUSTIN AND KELLEY

ANNUAL REPORT OF WILLIAM P. BELDEN, SOLICITOR, FOR THE YEAR 1906.

The following is a general summary of what is shown by my monthly reports rendered during the year above mentioned.

I.

Cases disposed of by litigation or settlement.

1. Girard vs. Mc Rae, The Cleveland-Cliffs Iron Company.

This case was tried before Judge Stone in December 1905, but his decision was not rendered until March 1906, at which time a final decree was entered entirely quieting the title of our Company to the land in question. No appeal was taken from Judge Stone's decree. (See my March report.

2. Bay Mills Land & Lumber Company vs. Grondin.

This was a suit to cancel certain tax titles on land in Schoolcraft County and was decided by Judge Steere in our favor. (See January report.)

3. The Cleveland-Cliffs Iron Co. vs. Gauthier.

This case was decided in our favor by the Supreme Court of Michigan in March 1906, (See March report). Subsequently a motion was made for a rehearing, but this application was also denied by the Supreme Court (See reports May and June.).

4. Munising Railway Company vs. Timothy G. Maney, et al.

This was the condemnation proceeding brought by the Munising Railway Company on its Austin extension. My April report shows the various amounts paid in settlement and the reasons for doing so.

5. Mc Carthy vs. Pioneer Iron Company.

This was a suit brought in the Marquette Circuit Court to recover damages for the death of Walter Mc Carthy who fell into a charcoal kiln. The Pioneer Iron Company held an insurance policy with the United States Casualty Company who assumed the defense. (See my August report). This case was subsequently settled by the payment to Mr. Mc Carthy of $700 by the Insurance Company.

6 . The Cleveland-Cliffs Iron Company and George J. Maas against Thomas Nesbitt.

This suit was brought to quiet our title against Nesbitt's claim that he had acquired a certain interest in the minerals by his deed from Virginia Hadrich which she said was intended as a surface deed. This suit was subsequently settled by the purchase from Nesbitt of his interest in the land. (See reports of August and September).

7. Clement vs. Munising Railway Company.

This suit was a small case in trover in Alger County, wherein Clement claimed that certain ties and other timber were wrongfully shipped by the Munising Railway Company. This suit was settled for a mere nominal consideration.

II.

Cases argued or tried during the year 1906, but not disposed of.

1. The Cleveland-Cliffs Iron Company vs. East Itasca Company.

This suit was argued in St. Louis before the U. S. Circuit Court of Appeals on Monday January 15th. On May 9th, the Court filed an

opinion affirming the decision of Judge Morris. In this case we have asked the Supreme Court to review the decision of the Circuit Court of Appeals so that this matter is not yet finally disposed of.

2. John Hutchinson vs. The Cleveland-Cliffs Iron Company.

This case was brought on for trial at Escanaba at the October term, and the Court directed a verdict in our favor. The plaintiff has now taken an appeal to the Supreme Court.

3. Henry Gamble vs. The Cleveland-Cliffs Iron Company.

This case was brought on for trial at Detroit in the U. S. Court in November, and the court directed a verdict in our favor. Plaintiff has taken an appeal to the U. S. Circuit Court of Appeals and this case will likely be heard at Cincinnati in May. It presents the claim of Henry Gamble for a real estate commission on the purchase from the Manistique Lumbering Company.

III.

Cases pending January 1, 1907.

In addition to the East Itasca, Hutchinson and Gamble cases mentioned in the previous subdivision, there were pending on January 1, 1907, the following cases.

1. Arctic Iron Company vs. The Cleveland-Cliffs Iron Company, et al.

Suit pending in the U. S. Circuit Court at Marquette for an accounting relative to the lease on the Regent Group of Mines.

2. Margaretha Lonstorf vs. George J. Maas and The Cleveland-Cliffs Iron Company.

Suit filed in the U. S. Circuit Court at Marquette for an accounting from Maas. Our Company is interested only as a stockholder.

3. Charles Johnson and The Cleveland-Cliffs Iron Company vs. Philip J. Hogan, Louise T. Hull, John R. Gordon, et al. Marquette Circuit Court in Chancery.

This case relates to Lots 7, 8 and 9 of Section 36, Town 45 - 25 forming a part of the Isaac Johnson lands and this is a suit to quiet our title purchased from Johnson.

4. The Cleveland-Cliffs Iron Company vs. Louise T. Hull, et al.

This is a similar suit filed in the Marquette Circuit Court in Chancery to quiet our title to three forties in Section 34 of the same Township purchased from the Isaac Johnson estate under exactly the same circumstances.

5. Pioneer Iron Company vs. Charles Muck, et al.

Ejectment suit involving strip of land twenty feet wide adjoining the D. S. S. & A. Right of Way at Negaunee which was once occupied by that Company under a misapprehension as to its rights.

6. Pioneer Iron Company vs. Thomas H. Harris.

Ejectment suit of the same character as the foregoing. Harris has offered to release his claim if given a lease of the land and his proposition will probably be accepted.

7. Mitchell vs. Arctic Iron Company.

This case involves the titleof the Athens Iron Company to the Mitchell and Gaffney Lots of Harvey's Addition, and has been the subject of a great deal of attention.

IV.

The following is a summary of the written opinions and reports rendered during the year.

	Min. Dept.	L. Dept'	Fur. Dept.	Ry. Dept.	Mr. Mann & Mr. Mather,	Mr. A. H. D. & K.,	Mr. Merriam.
Jan.	14	9	4	2	2	0	0
Feb.	8	8	1	1	2	0	0
March	4	4	1	1	0	0	0
April	5	10	0	2	7	2	
May	11	16	0	3	9	5	0
June	8	17	1	4	10	12	0
July	7	11	0	2	8	1	5
August	11	6	1	0	4	2	0
Sept.	11	13	0	4	6	5	1
Oct.	20	20	4	0	8	11	0
Nov.	10	16	0	5	7	4	1
Dec.	7	10	1	1	5	8	1
	116	140	13	25	68	50	8

Total 420.

V.

The list of deeds, agreements, leases, etc. including all instruments exclusive of pleadings and other legal documents used in the trial or preparation of cases, is as follows:

This list does not include deeds, leases, etc. prepared by the departments and submitted to me merely for approval.

Jan.	15	July	6
Feb.	9	Aug.	4
March	6	Sept.	8
April	11	Oct.	8
May	4	Nov.	10
June	12	Dec.	7
	57		43

Total 100.

VI.

Traveling.

During the year, we have made at the request of the different departments 72 trips to Marquette, 5 trips to Munising, 5 trips to Detroit, 4 trips to Chicago, 3 trips to Cleveland, 3 trips to Escanaba,

two trips to the Soo, one to Manistique, one to Ontonagon, one to Newberry, one to Appleton, one to Cheboygan, two to Duluth, one to Los Angeles, one to Milwaukee, one to Grand Rapids and one to St. Louis.

VII.

Expenses.

During the year 1906, the amount of money which I expended for traveling expenses for the Company's proportion of my office expenses and for legal expenses which have been paid through my office, are as follows given by months. The items of these months appear in detail attached to each monthly report.

January	$111.48
February	106.75
March	82.86
April	140.17
May	196.56
June	118.39 (Regular)
June	261.00 (Special, Los Angeles trip on Redfern Deposition).
July	115.02
August	70.40
Sept.	121.43
Oct.	128.57
Nov.	235.00
Dec.	168.74
	$1856.37

For the purpose of comparison, will say that my total expenditures for the same purposes during the year 1905 as shown by my annual report for that year was $1,755.64.

VIII.

Local Attorneys.

During the year 1906, Mr. H. M. Norris has acted as our local attorney at Ironwood.

Mr. H. J. Grannis has acted as our local attorney at Duluth.

Mr. H. B. Freeman assisted the Land Department in some small matters in Munising.

Mr. G. R. Empson of Gladstone assisted in the trial of the Hutchinson case at Escanaba in October.

None of the foregoing attorneys have performed any very substantial work during the past year.

IX.

Counsel.

Mr. Horace Andrews of Hoyt, Dustin & Kelley has made several trips here during the year 1906 and has rendered very valuable assistance in the important cases we have been engaged in.

X.

Except as above mentioned all of the legal work of the Company has been performed by Mr. Berg and myself. In all personal injury cases and cases generally, except those involving large interests, we have prepared, tried and disposed of as outlined at the beginning of this report.

XI.

Upper Peninsula Land Company Work.

I have attended the meetings of the Board of Managers of this Company so far as possible during the past year and at the request of the Board accompanied Mr. Merriam on his trip to London last March which occupied a full month of my time.

I have prepared such contracts as Mr. Merriam desired and have assisted in the correspondence of some outstanding taxes and other matters and have advised generally on such matters as the Board has requested.

My expenditures incurred in their behalf have been as follows:

Feb' 16,	Trip to Chicago to attend meeting of Board of Managers	$ 15.10
" 27,	" " " " " special " " "	7.65
March 9 to April 5,	Trip to London	453.50
April 21,	Trip to Chicago to attend meeting of " "	14.75
July 23,	" " " " " "	13.75
Sept.15,	" " " " " "	13.65
October 13,	" " " " " "	14.50
Nov. 17,	" " " " " "	12.75
	Total	$ 545.65

XI.

Other Work.

As each of the monthly reports has specified in detail the work done during the year, I will only summarize here the more important tasks in which we were engaged.

1. The preparation of the briefs and record and the argument of the East Itasca case at St Louis, which took nearly three weeks.

2. Trip to London in March.

3. Work done with Mr. Andrews in the preparation of various opinions on Negaunee Mineral land titles.

4. Trip to Los Angeles to take Mr. Redfern's testimony.

5. Work done in the commencement of the Hull cases relating to Isaac Johnson land in the Swanzy District and other work in connection therewith.

6. Preparation and trial of the suit brought by Henry Gamble at Detroit.

7. Preparation and trial of the Hutchinson case at Escanaba.

8. A large amount of work in the examination of titles of land for the mining and land departments.

9. Examination of titles, negotiation and consummation of purchases from the Sterling Mackenzie heirs, the Deer Lake Company lands and various purchases from Lewis Corbit.

In addition to these special matters, the routine work of the departments was much heavier than during the year 1905.

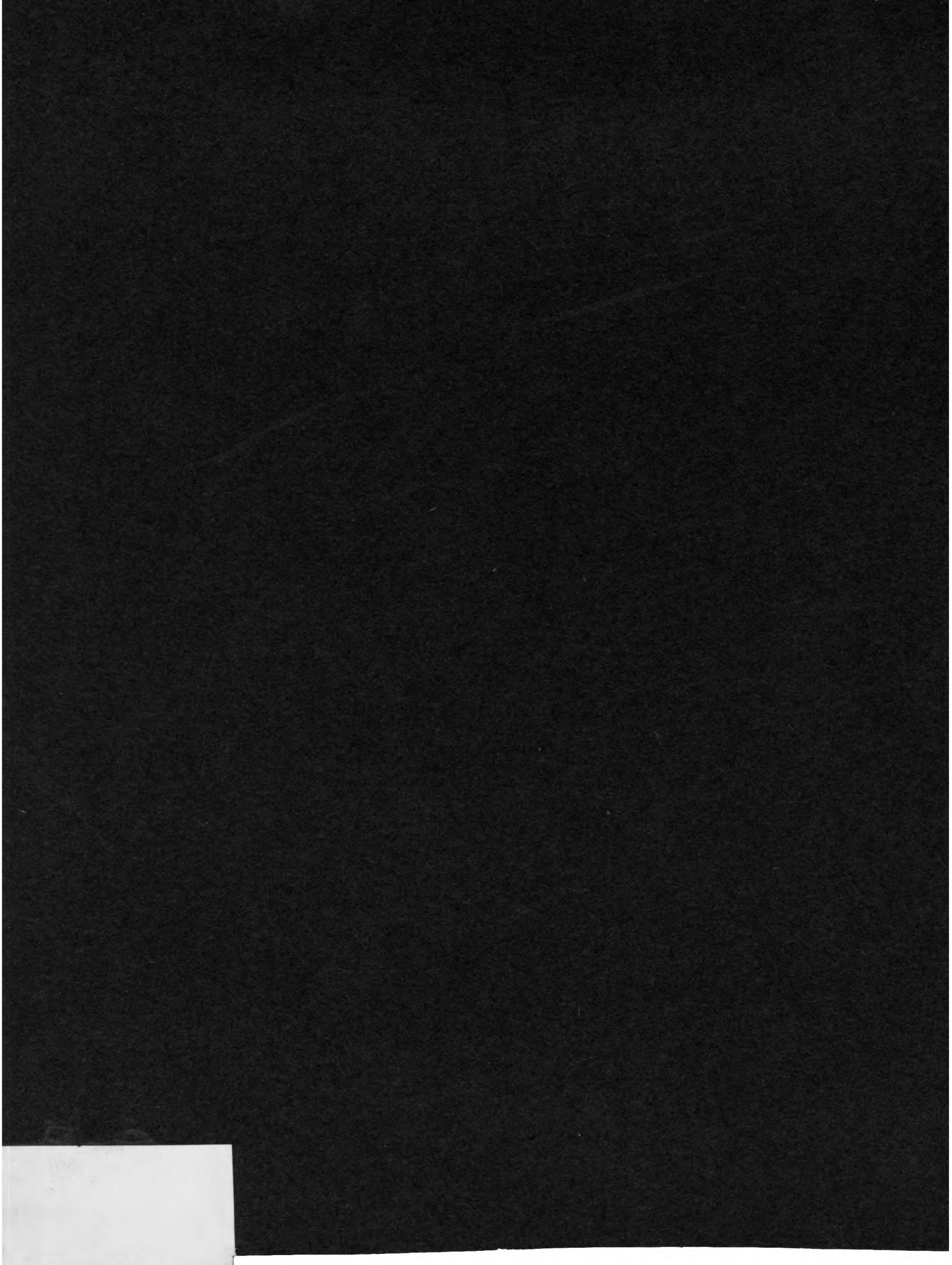
The number of opinions and reports rendered in 1904 was 248, the number of opinions and reports rendered in 1905 was 340, and the number of opinions and reports rendered in 1906 was 420.

The number and extent of trips I was required to take in 1906 greatly exceeded that of any previous year.

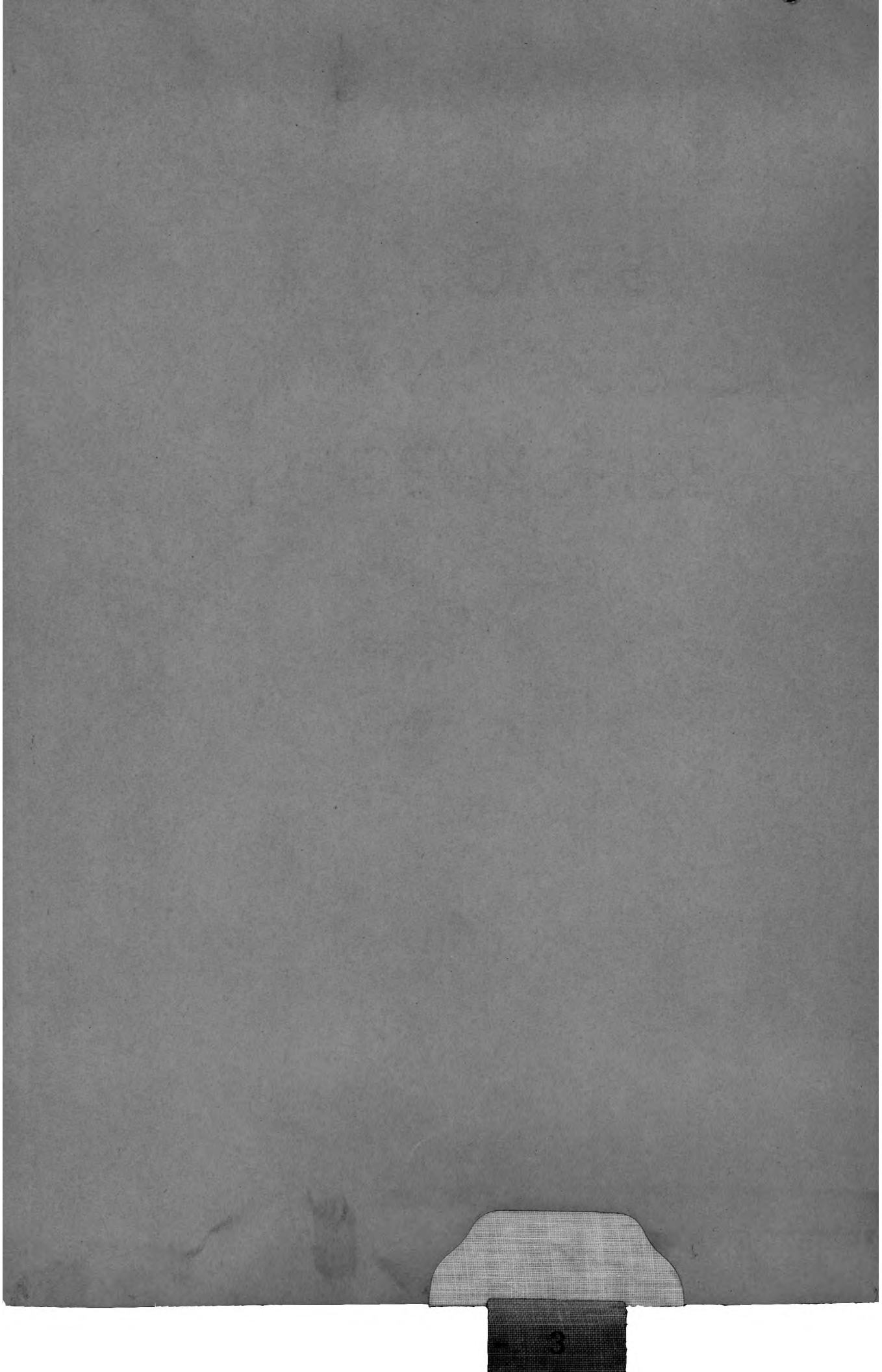
William P. Belden

Solicitor,

Annual Report of William P. Belden, Solicitor, for the year 1906.



W . P . BELDEN.



THE CLEVELAND-CLIFFS IRON CO.,

ISHPEMING, MICHIGAN.

MASTER MECHANIC'S REPORT

FOR YEAR ENDING NOVEMBER 30TH, 1906.

(DATED) DECEMBER 19TH, 1906.

INDEX.

INDEX.(continued)

Mr. M. M. Duncan, Agent,

Ishpeming, Mich.

Dear Sir:

Following is the Master Mechanic's report on the mechanical equipment of the various mines for the year ending November 30th, 1906, together with a summary of the monthly engineer's logs.

CLIFFS SHAFT MINE.

Considerable improvement has been made in the equipment of this mine and will be noted under the following heads.

HOISTING PLANT.

The old hoisting engine which has done service for so many years, and has been the source of so much trouble and delay, was replaced by a new modern machine. The new engine is a simple, non-condensing, corliss, single engine, and fly wheel. The engine is 24" x 48", with long stroke cut off. The two drums are each 10 ft. diameter. The engine has sufficient power to hoist from both A & B shafts at the same time. The old hoist was removed and the new one installed in three weeks time. A small hoist was installed temporarily at A shaft to hoist men and supplies while the change was being made. The new hoist has proved to be entirely satisfactory.

PUMPING ENGINE.

We are using the same pumping equipment that was in service last year. That is, the old Cornish pumping engine which serves both A & B shafts, and a Worthington compound condensing pump on the fourth level. The Cornish pumping equipment is very old, and is fast getting beyond repair. It would not be advisable

to rebuild this, and I would recommend in its stead that another steam pump be purchased and placed on the fourth level as a spare to the one there now. This second pump should be larger than the one we now have at this place, as the present pump is barely able to handle the water. I have prices and specifications on a pump suitable for this place. This is a Prescott compound duplex, of the following dimensions: Steam 12"/22"-18", and water plunger 7"x18". This pump would cost $2400.00 installed. This improvement should be made at once as the Cornish pump is liable to completely fail any time, and the steam pump is barely adequate for the work. I wish also to add that this steam pump is one which came from the old Jackson equipment, and is an old pump and very light for this service. A duplicate of this pump was installed in the Maas Mine, and the water end failed entirely with a few months service.

COMPRESSORS.

The old compressors, so long a source of trouble and so extravagant of steam, are soon to be discarded. A modern two stage compound condensing compressor was purchased and delivery was promised June 30th. This machine did not arrive until November. Erection of this is being pushed as fast as possible, and we hope to start this machine by December 10th. This compressor is made by the Nordberg Mfg. Co. of Milwaukee. It is a duplicate of the one we have at the Lake Mine, except it has considerably heavier frame and some improvements in minor details. Its dimensions are as follows:

Steam cylinders 22" & 44" x 48" stroke.

Air " 23" & 37" x 48" stroke.

Running at a moderate speed it will compress 4000 cu. ft. of free air per minute.

The old compressors will be left standing, as the room

is not required, and they can be used in case of accident or delay to the new compressor.

CRUSHER PLANT.

No change has been made to the crusher plant during the year, and no trouble of consequence has occurred other than what ordinarily happens to a plant of this kind during operation.

BOILER PLANT.

The same boilers are in operation as last year. To remedy our bad draft a power fan was installed with benificial results. These boilers are considerably over-loaded, but will be largely relieved by the decreased demand owing to the installation of a new and economical compressor.

CLIFFS SHAFT AUXILLARIES.

Another drill sharpener was added to the blacksmith shop equipment, and the old Ajax machine was sent to the Ashland Mine, where their demand for this class of work is comparatively light.

The Word drill sharpeners which we now use at this mine are very rapid and effective, but are rather expensive to maintain. This is owing to some faults in design which we are correcting as much as possible. We are now contemplating building a drill sharpener which we think will more nearly answer our requirements than any thing in the market.

The old electric dynamo was discarded, and a 15 K.W.-D.C. dynamo installed in its stead. This allows us to use incandescent as well as arc lights on this circuit, and therefore permits us to light our offices from this plant. This was desired, not only as a matter of economy, but on account of the poor service rendered by the city plant. This installation has proved very satisfactory.

SALISBURY MINE.

The equipment of this mine has not been changed during the year.

Several accidents have happened to the Cornish pump on account of its age. We hope to be able to make this pump serve the life of this mine.

A new skip drum was placed on the hoisting engine, but it has proved to be very disappointing.

The Lake Shore Engine Works have pleaded very earnestly for a share of our heavy hoisting work. They were given the contract for this drum, and it has proved their inability to handle this class of work. This drum began breaking before it had been in operation 6 weeks. By carefull handling we hope to make it outlast the mine.

The air compressor and boiler plant have not been changed in eny way.

LAKE MINE.

The equipment of this mine has operated very successfully during the year.

AIR COMPRESSOR.

This machine proves as satisfactory as formerly. Only a few delays occurred during the year and these were due to hot boxes. Air is furnished the Hard Ore Mine from this plant, and service is entirely satisfactory. The highly satisfactory and economical operations of this machine fully warrants our duplicating it where necessary.

HOIST.

This hoist is a Sullivan first motion with a pair of 7 ft. drums. The engines are Duplex Corliss, 20" x 42", non-condensing. This hoist operates entirely satisfactory. There is only

one difficulty. It has one drum for the cage, and one for the skips, both operated by one man. When one drum is operating the other necessarily must stand still, and often causes delay to one side or the other. This is more especially true for the reason that the demand on both drums is constantly increasing. When they entirely discontinue lowering timber at the old shaft I think it will be necessary to install a separate hoist for the cage.

ELECTRIC HAULAGE.

This equipment has operated entirely satisfactory during the year. The increased size of conductor we put in last year has made our locomotives operate much more satisfactorily. We have a spare generator, but had no occasion to use it as the old one has given no trouble.

PUMPS.

The pumping equipment has not been changed during the year, nor given any trouble.

At the pump station on the fourth level we have a Deane Duplex Compound, 12" x 20" & 6" x 12", and a Prescott Duplex Compound, 14" x 26" & 10" x 18". Both pumps operate condensing.

BOILER ROOM.

The boiler room equipment at this plant continues to operate satisfactorily.

Our demand for steam is such that we often have to operate the entire 5 boilers which does not leave a spare for emergency. This is especially true during the break-up in the spring when our pumps are working hard. I have recommended the installation of a sizth boiler to overcome this difficulty. The necessity for this extra boiler will become greater as the plant becomes older and the furnaces have to be rebuilt. The boiler

room was built with space for another boiler.

CLEVELAND.

No changes or accidents worthy of mention have taken place during the year.

NO. 4 ENGINE HOUSE.

The Cornish pump does all the pumping at this mine except in case of emergency. In such case the steam pump is put in service. Both the steam pump and the Cornish pump work very poorly because of the low steam pressure we are compelled to carry. This is on account of the age and condition of the boilers. It is expected to install two of the boilers from the Maas Mine as soon as the new equipment at that mine is put in service.

HARD ORE SHOP.

No changes have been made during the year. There is one improvement which must be made during the coming year. Our blacksmith shop is entirely too small and will have to be enlarged. During the summer considerable of our heavier repairs can be done outside the shop, such as repairing skips, cages, etc., but in the winter this is impossible on account of the severity of the weather. There is considerable new work which we could do advantageously if we had the room. We could not hope to manufacture cheaper than we can buy on the outside, but we could often equal prices, and could save considerable time on work for which there is urgent need.

It is intended to buy some new shop tools during the year and remove some of our older and antiquated machines to the outlying mines where the demand on these tools is less urgent.

STEAM SHOVELS.

The shipping season has been long and the quantity of ore handled large. Our shovels have answered every demand and have given us little or no trouble. One new shovel was added during the year for the Princeton group of mines. It is a Bucyrus, 70 ton, duplicating the one bought for the Negaunee Mine. An order is soon to be placed for a shovel for the Crosby Mine, and I advise duplicating our last shovel. Our shovels should all be of one make on account of repairs, and for the reason that we can then shift our men from one shovel to another if they all operate the same.

The old shovel which we brought down from the Ashland last year, and proved of so little use to us here, was sent back to the Ashland. They use it there where the demand is light, and it saves shunting the other shovel so much.

MAAS MINE.

No changes have been made to the temporary equipment of this mine.

Work was commenced early in the summer on the permanent equipment. The engine and boiler house is now complete. The engine room is 80 ft. x 52 ft. inside, with a basement containing foundations, heater and auxillaries, and one floor which is the engine room floor. Space is allowed for the skip hoist, cage hoist, air compressor and electric equipment. The skip hoist is the old Lake compound condensing hoist, rebuilt as a duplex, simple, first motion hoist. It has just arrived. Foundation for this machine is complete and it will be erected at once. The cage hoist has been purchased, and foundation is now being built, so that it can be erected as soon as it arrives. The question of furnishing compressed air to this mine has not been decided, hence no compressor has been purchased. This question, as well as the question of electric equipment, depends upon the disposition of

the water power proposition.

The boiler room joins the engine room, and is 50 ft. x 88 ft. The boiler room equipment includes 3-350 H.P. Stirling water tube boilers, with Sturtevant economizers, and induced draft and Murphy stokers. A Baragwanth heater receives the feed water direct from the pumps, and from here it is passes through the economizer to the boilers. Piping is so designed that feed water can by-pass the heater or the economizer in case either need inspection or repairs. The economizer and fan are so designed that either of both may be by-passed by the boiler gasses when inspection or repairs are necessary. Feed pumps are duplicated, and are large enough to furnish water for fire protection.

The stokers are built in furnaces extending in front of the boilers in what is called "Dutch oven setting". Coal bins are built on top of these furnaces and coal is fed through the bottom. Coal is brought into the boiler room in a tram car, elevated on a platform elevator to height of bin. A track passes over top of bins allowing coal to be dumped direct into the bins. When the coal comes from the dock it passes over a platform scale and is weighed. A track is built into the floor in front of the boilers and the same car which handles coal can be pushed in front of the boiler and receive the ashes, go to the elevator, and from there be dumped from trestle, or in suitable bin.

One of the boilers in this plant will be put in service during December, and when working properly, the old boiler plant is to be shut down.

A steam line will still have to be maintained to the old engine room to operate the hoist and air compressor until the new ones are in place. The present compressor is not large enough for the requirements, and a ten drill Sullivan straight line compressor was purchased to relieve this necessity until provision is made for permanent air equipment. This compressor will be placed

temporarily in the basement of the new engine room.

The foundations for the shaft house are completed and the steel is all on the ground. The erection of this structure will begin about December 15th, and should be completed February 1st. The foundation piers for this structure are settling, and as this is liable to continue for some time, cavities were left in the top of these piers to receive jack screws, by which we will be able to keep this structure level. There is a small amount of quick sand accumulating in the sump at the ledge pump station, which I think accounts for the settlement noted.

OGDEN MINE.

This mine was not operated during the year.

LUCY MINE.

This mine has not been operated during the year. The Rand Imperial Compressor was removed to the Negaunee Mine, and is now in operation there.

NEGAUNEE MINE.

No change has been made to either boiler plants, nor have we had any serious trouble. A new fly wheel was put on hoist, removing the old one which was badly cracked and dangerous.

Electric haulage operated entirely satisfactory through the year.

The demand for air having exceeded the capacity of the old compressor, the Rand Imperial was taken from the Lucy and installed here, and is doing good service.

An extra flow of water in this mine made it necessary to

start up the Worthington pump on the fourth level and to run both pumps on the 6½ level. This we are now doing constantly. With this amount of water we have no spare pump. When repairs are necessary they have to be done in the quickest possible time and the pump put in service again, as the remaining two pumps will not handle the water. Should any serious accident happen to one of the pumps we would have to put on a bailer, and very much hinder mining operations. The two pumps on the 6½ level are designed to operate from the 9th level. I recommend that another be bought of the same size and installed in the 9th level, and the present two moved to this level when necessary. This pump should be ordered at once, as delivery on this class of machinery is very slow. This improvement, including cutting of pump house for the three pumps, sump, extension of steam pipe and water column, and installing the one pump, would cost about $15000.00, and would take seven months from date of authorization.

Since this mine caved and the water increased we do not get any water at the ledge, and hence do not operate that station. We will be able to remove these pumps and use them elsewhere.

No change has been made in the top tram system.

AUSTIN MINE.

The boiler equipment of this mine has not changed since last year. It consists of 2 Burt, fire box boilers, one of 125 H.P. capacity, and one of 150 H.P. The water has increased so much here, and the style of pumps used are so extravagant of steam, that these boilers are fully loaded. This will be relieved in the near future, as a triple expansion pump has been purchased of a size sufficient to serve both the Austin and the Stephenson Mines. This will soon be placed in the Stephenson Mine, and the Austin

Mine water drained to this point. This will be a great improvement over our present method of handling this water.

A central machine shop is being built. The equipment from the Austin shop will be moved to this new shop as soon as it is complete.

ASHLAND MINE.

There has been no change in the hoisting plant. The compressor has not been changed, but a cooling tower was built, so that the compressor now runs condensing.

MINE PUMPS.

The mine pumps are practically the same as lasr year. A large triple was bought for the 16th level. When the 16th level was reached it was thought more advisable to place this pump on the 17th level, and it will be installed as soon as a pump station is prepared. The pump is at the mine.

BOILER PLANT.

No change has been made in the boiler plant, except the installation of a new steam header, which was purchased some time ago.

TOP TRAM PLANT.

This plant operated satisfactorily, and has not been changed during the year, except to repair it thoroughly.

CROSBY MINE.

The Crosby Mine was started up and has been operating

during the year. One Burt fire box boiler was added to the boiler plant, which now consists of 2 Burt boilers, 125 H.P. each.

The pump station was changed to a more accessible place and repiped.

An electric underground haulage was installed, similar to what we have at the Lake and Negaunee Mines. This consists of a Sturtevant high speed engine, belted to a General Electric, 45 K.W. generator. Two 6½ ton General Electric locomotives. This installation has given us complete satisfaction.

IRON BELT MINE.

The equipment of this mine is the same as last year. The mine is now pumped out and a pump station and sump is being cut on the 8th level. A triple expansion pump is soon to be installed on this level.

STEPHENSON MINE.

No changes have been made to this mine's equipment during the year, and no serious trouble encountered. A new boiler has been purchased, which when installed, will complete the boiler installation. This will make 3 Burt fire box boilers, 125 H.P. each. The permanent engine and boiler house is completed, as is the foundation for the skip hoist. This hoist has arrived and will soon be installed. The shaft house is completed and head sheaves are in place.

PRINCETON MINES.

These mines are operating with the same equipment as last year. The trouble we were having with the boilers at these mines has been overcome by providing river water for steaming pur-

poses, and further by providing a heater for No. 2 plant, which had been operating without one. The flues in these boilers were renewed, and since these improvements were made have given us no trouble.

SOUTH JACKSON MINE.

The South Jackson Mine was equipped during the year.

BOILER PLANT.

This consists of 2 fire tube boilers, 72" x 18 ft., set with Dutch oven furnaces and rocking grates.

HOIST.

The hoist is one from the Old Jackson Mine, rebuilt into a single drum reversible hoist. Engines, 14" x 20", and drum 5 ft. diameter. It operates the skips in balance and proves very satisfactory.

COMPRESSOR.

This machine is the one formerly used at the Ogden Mine. It furnishes air to operate the chute closers.

CRUSHER.

Is a No. 8 McCully, driven by a corliss engine. This engine was formerly used at the Lake Mine to drive the electric generator for the underground haulage. It is exactly right for the work it is now doing. This equipment has been entirely satisfactory with the exception of a little trouble with the crusher near the end of the season. This has not been taken apart yet, but I think the trouble is a worn bearing on the main shaft. This will soon be overhauled so as to be ready to operate at the beginning of next season.

NORTH JACKSON MINE.

The old boiler plant at the North Jackson Mine was put in commission to furnish power to do some work on this property. The hoist already in the building was used. A small air compressor which was formerly at the Princeton No. 1 Mine was used. This compressor was in very bad condition, but was put in thorough repair and did very good service. It is about a two drill machine. This equipment is now being enlarged somewhat, and will be thoroughly repaired, as operations are to be carried on next year on a larger scale.

IMPERIAL MINE.

The equipment of this mine is to be overhauled and put in first class condition for next seasons work. The old boilers, which were past repair, were taken out and two Burt fire box boilers (second hand) are being installed. The present hoist will be used. A compressor will be borrowed from some other mine until the compressor which belongs to this mine can be returned. It is now in service at the Stephenson, but they will not need it after the central power plant is installed, which will be early next summer. Effort is being made to get this plant operating as soon as possible.

PUMP STATION AT PRINCETON.

A pump station is being built on the river above Princeton, and a new pipe line laid of sufficient size to furnish water for the present group of mines, and a prospective town, with very liberal allowance for future demands. The pumps are duplicated, and space is left for a third if demands should ever require it. Two boilers are being installed and space is provided for a third should it ever be required. The pipe line is 8" wood line. This

is banded to stand a working pressure of 150 lbs. which exceeds the pressure we will need to carry. The pumps are Prescott, direct acting, duplex, compound condensing, and will prove very economical of steam and very reliable. The pumps are 9" x 18" & 8" x 18", and the condensers are of the independent jet type, 6" x 8" x 10". One boiler is the 50 H.P. that was removed from the Austin, and the other is a new boiler of 60 H.P. Both are fire box boilers. Feed water is provided.

The work of installing this equipment is progressing in a satisfactory manner, and it is expected to start up some time in January.

CENTRAL POWER PLANT.

Boilers and compressors have been bought for this plant, but have not arrived. Building is under way, and it is expected to have this enclosed by the 1st of January. The machinery will begin to arrive about that time and its installation will be hastened as much as possible. This equipment is very similar to that being installed at the Maas Mine, including mechanical stokers, economizers and induced draft.

A shop building is being built at this point and will be equipped to do all work for this group of mines.

SMITH MINE.

Boilers have been purchased for temporarily equipping the Smith Mine. These are intended only for opening the mine. In the meantime a permanent plant is contemplated which will be similar to the Maas installation. The boilers for the tempory plant are overdue now, but I do not expect them before January 1st. This work will be at a great disadvantage owing to severe

weather, and it will therefore take about two months to install these boilers. Building is about completed to receive them.

Following are the comparative tables for the various mines, as complete as our records will permit, together with a summary of the engineers' logs.

Very respectfully submitted,

O. D. McClure

Master Mechanic.

COMPARATIVE TABLES.

YEAR.	COAL BURNED.	ORE & ROCK.	CUBIC FT. AIR.	TONS HOISTED PER TON COAL.	CUBIC FT. AIR PER TON HOISTED.	GALLONS OF WATER.	SHIFTS
CLIFFS SHAFT.							
1900	7,969.3	-221,857	359,115,088	35.4	1,410	345,630,130	538
1901	8,412.8	-283,088	447,136,140	32.5	1,580	353,314,205	549
1902	8,381.8	-278,656	401,970,520	33.2	1,442	377,910,450	538
1903	8,150.4	-268,568	322,753,874	34.1	1,200	374,292,985	511
1904	6,287.6	-169,651	191,094,862	27.	1,127	372,046,285	270
1905	7,421	-204,645	271,587,404	27.6	1,355	353,087,800	
1906	9,204.5	-272,735	451,440,636	28.3	1,794		
SALISBURY MINE.							
1900	3,513	-177,258	193,430,796	50.5	1,090	65,724,195	833
1901	3,621,3	-190,816	184,878,547	49,6	970	71,466,792	840
1902	3,800	-175,782	191,100,362	46.1	1,090	71,962,803	841
1903	4,167	-194,781	264,830,023	46.7	1,360	88,636,312	828
1904	3,540	-159,878	216,911,720	45.2	1,358	77,897,201	550
1905	3,750	-154,017	219,765,211	40.5	1,423	76,346,425	
1906.	3,909	-152,034	219,345,241	39,7	1,461	77,100,543	
LAKE MINE.							
1900	8,218	-510,132	376,482,932	62.	740		
1901	9,117.7	-472,730	393,632,563	51.7	840	62,998,188	803
1902	8,400.5	-470,728	440,196,332	51.8	952	64,188,597	841
1903	8,502.8	-468,277	441,329,198	50.	993	70,848,359	787
1904	6,983	-281,399	355,084,057	40.3	1368	78,662,195	
1905	10,346	-505,321	885,737,363	48.8	1753	77,492,105	
1906	11,072	-559,877	784,511,853	51.8	1247.1	80,626,208	

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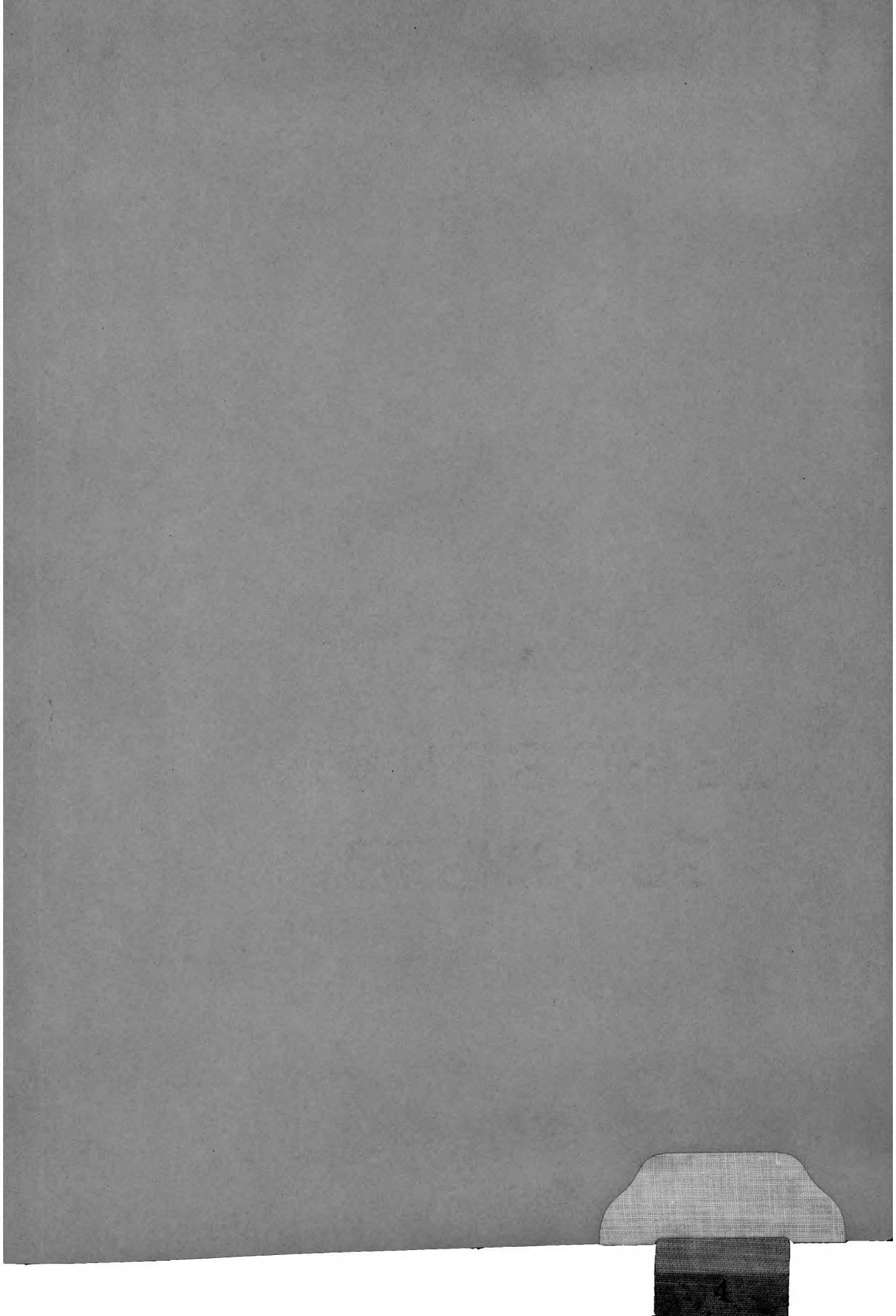
COMPARATIVE TABLES. (Continued)

YEAR.	COAL BURNED.	ORE & ROCK.	CUBIC FT. AIR.	TONS HOISTED PER TON COAL.	CUBIC FT. AIR PER TON HOISTED.	GALLONS OF WATER.	SHIFTS
			HARD ORE MINE.				
1900	3,359.7-	80,577	156,642,514	23.9	1,875	127,301,055-544	
1901	3,537.4-	83,321	198,187,706	23.5	2,375	123,434,439-545	
1902	3,749.9-	79,329	209,140,586	21.3	2,550	124,952,502-561	
1903	3,778.6-	75,458	202,735,698	18.8	2,660	139,284,403-594	
1905	2,549. -	73,228	387,509,010	28.8	5,278	101,183,553-	
1906	3,007.6-	81,019	360,850,200	26.3	4,508	114,163,803-	
			ASHLAND MINE.				
1901	5,226.6-	162,368	22,438,648	31.	1,385	101,108,902-	
1902	11,245.9-	368,237	408,713,080	32.	1,105		
1903	11,946. -	387,604	315,978,744	32.5	823		
1904	8,250. -	271,627	150,808,074	32.9	555	110,933,228-	
1905	8,967. -	343,558	376,921,120	35.3	1,095	145,617,467-	
1906	9,709. -	362,697	369,577,268	37.5	1,022	130,346,725-	
			NEGAUNEE MINE.				
1904	8,182.5-	166,781	233,721,669	20.4	1,401	476,056,512	
1905	7,386. -	245,422	211,667,755	33.2	861	345,967,009	
1906	10,465.5-	258,354	235,730,810	25.5	921		
			AUSTIN MINE.				
1905	1,867	61,878	51,808,300	33.8	837.5	95,000,000	
1906		165,445	56,931,414	53.4	374.		
			MAAS MINE.				
1905	4,066		139,268,772			311,792,458	
1906	4,170.5		260,733,698				



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STATEMENT OF NON-RESIDENT CORPORATION.

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In order that there may be no variance between the records of your Company and this office, and to avoid unnecessary correspondence, please fill the following blanks and return to this office.

Name of Corporation.

Hopkins Steamship Co.

Date of Charter.

February 12th 1891.

Number of acres of land held in West Virginia if in excess of 10,000.

None

Names and Postoffice addresses of President, Secretary and Treasurer.

President. Wm G. Mather
Cleveland Ohio.

Secretary. J. H. Sheadle
" "

Treasurer. Wm G. Mather
" "

Name and address of Statutory Attorney for West Virginia.
A. C. Scherr, Auditor, Charleston, W. Va.

Authorized Capital Stock $ 265.000.00

Tax due May 1st, as per schedule $ 91.25

I hereby certify that the above statements are correct.

Signed in 1906. W G Mather
Date 07 Wm G Mather Jr.

Let the above be signed by some officer of the Company.

A. C. Scherr
Auditor.

☞ **Be Sure to Return this Blank at Time of Remittance for Tax Due.** ☜

A. O. Cor. No. 57.

1907.

STATEMENT OF NON-RESIDENT CORPORATION.

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SECTION

In order that there may be no variance between the records of your Company and this office, and to avoid unnecessary correspondence, please fill the following blanks and return to this office.

Name of Corporation.

Presque Isle Transportation Co.

Date of Charter.

Oct. 21st 1897.

Number of acres of land held in West Virginia if in excess of 10,000.

None.

Names and Postoffice addresses of President, Secretary and Treasurer.

President. B. F. Jones Jr. Pittsburg Pa.

Secretary. Wm G. Pollock Cleveland Ohio.

Treasurer. Wm G. Mather

Name and address of Statutory Attorney for West Virginia.
A. C. Scherr, Auditor, Charleston, W. Va.

Authorized Capital Stock $500.000.00

Tax due May 1st, as per schedule $150.00

I hereby certify that the above statements are correct.

signed in 1906. W G. Mather

date 07 Treasurer

Let the above be signed by some officer of the Company.

A. C. Scherr

Auditor.

☞ Be Sure to Return this Blank at Time of Remittance for Tax Due. ☜

A. O. Cor. No. 57.

1907.
STATEMENT OF NON-RESIDENT CORPORATION.

PAGE
SECTION

In order that there may be no variance between the records of your Company and this office, and to avoid unnecessary correspondence, please fill the following blanks and return to this office.

Name of Corporation.

The Cleveland-Cliffs Iron Co

Date of Charter.

May 4th 1891.

Number of acres of land held in West Virginia if in excess of 10,000.

None

Names and Postoffice addresses of President, Secretary and Treasurer.

President. Wm G. Mather
Cleveland Ohio

Secretary. J N Shaddle
" "

Treasurer. Wm G. Mather
" "

Name and address of Statutory Attorney for West Virginia.

A. C. Scherr, Auditor, Charleston, W. Va.

Authorized Capital Stock $5.000.000 00

Tax due May 1st, as per schedule $72500

I hereby certify that the above statements are correct.

W G Mather
Pres

Assigned in 1906 settled 07

Pres't Treas.

Let the above be signed by some officer of the Company.

A. C. Scherr

Auditor.

☞ **Be Sure to Return this Blank at Time of Remittance for Tax Due.** ☜

A. O. Cor. No. 57.

1907.

STATEMENT OF NON-RESIDENT CORPORATION.

PAGE
SECTION

In order that there may be no variance between the records of your Company and this office, and to avoid unnecessary correspondence, please fill the following blanks and return to this office.

Name of Corporation.

Grand Island Steamship Co

Date of Charter.

November 28th 1907

Number of acres of land held in West Virginia if in excess of 10,000.

None

Names and Postoffice addresses of President, Secretary and Treasurer.

President. W. G. Mather
Cleveland Ohio.

Secretary. J. H. Headle
" "

Treasurer. Wm G. Mather
" "

Name and address of Statutory Attorney for West Virginia.
A. C. Scherr, Auditor, Charleston, W. Va.

Authorized Capital Stock $ 25,000.00

Tax due May 1st, as per schedule $ 20.00

I hereby certify that the above statements are correct.

Signed in 1906. Pd '07

W. G. Mather
Pres.

Let the above be signed by some officer of the Company.

A. C. Scherr

Auditor.

☞ Be Sure to Return this Blank at Time of Remittance for Tax Due. ☜

8–1188

No. 40 5.

RETURN THIS CARD

[X9–215]

CONFIDENTIAL

Department of Commerce and Labor
BUREAU OF THE CENSUS

Department of Agriculture
FOREST SERVICE

PRODUCTS OF WOOD DISTILLATION IN 1906

Please fill out this card and return it promptly in the accompanying envelope, which requires no postage. The information called for will be used in the preparation of a report on the distillation of wood to be published jointly by the Forest Service and the Bureau of the Census; names of reporting firms will not be disclosed and a copy of the report will be sent to each.

Name The Cleveland Cliffs Iron Co.,

Post office

State

Location of plant or plants: Town Gladstone

County Delta, State Mich

Date of construction of plant Various 1896 to 1903

Number of days in operation in 1906 365

HARD-WOOD DISTILLATION.

WOOD USED.

KIND.	Quantity, cords.	Average cost per cord delivered at plant.	State from which obtained.
Beech, birch, and maple	77280	[illegible]	Mich
All others			

PRODUCTS.

KIND.	Unit of measure.	Quantity.	Average value per pound or gallon at plant.
Charcoal	Pounds	6,777,600	.00392
Crude alcohol	Gallons		
Refined alcohol	Gallons	291357	.547
Gray acetate	Pounds	3758945	1.99
Brown acetate	Pounds		
Tar and wood oils	Gallons		

Number of ovens ~, kilns 70, ~~pairs of~~ retorts 10

What is the average number of cords of wood per charge? Kilns 60.2 Retorts 4.8

How much time is required to char the wood? Kilns 27.6 Days Retorts 24½ hrs

What per cent of the total quantity of wood used for distillation did each of the following constitute?

Beech The records kept no difference Birch Maple

Oaks Kinds (If others, specify)

What per cent of the wood was in each of the following forms:

Body wood ~ Mill waste ~ Limbs ~

Stumps ~ Sawdust ~ "Tree run".

(Use reverse side of card for pine distillation.)

KIND.	Quantity, cords.	Average cost per cord delivered at plant.	State from which obtained.
Longleaf pine			

PRODUCTS.

KIND.	Unit of measure.	Quantity.	Average value per pound or gallon at plant.
Turpentine	Gallons		
Rosin	Pounds		
Tar	Gallons		
Oil of tar	Gallons		
Pyroligneous acid	Gallons		
Charcoal	Pounds		

Number of retorts ----------

What is the average number of cords of wood per charge? --------

What is the average number of charges per month for each retort? ----------

How much time is required for a run? ----------

What per cent of wood was in each of the following forms:

Body wood ---------- Mill waste ---------- Limbs ----------

Stumps ---------- Sawdust ----------

If you did not operate a plant during 1906 do not destroy this card, but give your name and address, and answer the other questions on the card.

Date of this report ----------

Signed R C Mann auditor

(Signature of person furnishing the information.)

Please fill out and return as soon as possible.

do not overlook this request.

No. [illegible]

Second Request.

WHOLE YEAR.

This blank is printed in copying ink for manufacturers who may desire to copy it in their letter books.

[STRICTLY CONFIDENTIAL.]

☞ *Please fill out this blank for your furnaces and return it as early as possible to The American Iron and Steel Association, No. 261 South Fourth Street, Philadelphia.*

PRODUCTION OF PIG IRON IN 1906.

FOR THE YEAR ENDED DECEMBER 31, 1906.

Name of Furnace or Furnaces Pioneer

Name of Owners or Lessees Cleveland Cliffs Iron Co

Post Office, County, and State 11th Floor Rockefeller Bldg Cleveland Ohio

STACKS.

Number of completed Furnace Stacks	1	Stacks building December 31, 1906	None
Stacks in blast December 31, 1906	1	Stacks rebuilding December 31, 1906	"
Stacks out of blast December 31, 1906	None	Stacks relining December 31, 1906	"

STACKS IN BLAST—How many DAYS in the LAST HALF of 1906 was each furnace in blast?

183 Days.

Furnace banked 17 days.

IDLE STACKS—Date when STACKS IDLE on December 31, 1906, may be blown in

ABANDONED STACKS—Number of STACKS IDLE on December 31, 1906, that will NEVER AGAIN MAKE PIG IRON. (Give name or No. of Stack) None

BUILDING STACKS—Date when STACKS BUILDING on December 31, 1906, will probably be completed None

REBUILDING STACKS—Date when you expect to have each REBUILDING STACK ready for blast. (If more than one Stack please give name or No. of Stack) None

RELINING STACKS—Date when you expect to have each RELINING STACK ready for blast None

PROJECTED STACKS—If you contemplate erecting any NEW STACKS in 1907 please give the number to be built, the size of each Stack, and the date when you expect to commence work upon each Stack None

LIMESTONE QUARRIED—GROSS TONS.

	Gross Tons.
How many tons of LIMESTONE did you QUARRY in the WHOLE YEAR 1906?	None
How many tons of LIMESTONE did you CONSUME in your Furnaces in 1906?	2822

☞ If you can not conveniently give exact figures of the limestone quarried or consumed a CLOSE ESTIMATE will answer.

FUEL USED.

Kind of Fuel used in the WHOLE YEAR 1906, Charcoal

Please state distinctly whether you used all coke, all raw bituminous coal, coke and raw coal mixed, all anthracite coal, anthracite coal and coke mixed, charcoal and coke mixed, or charcoal alone.

PIG IRON MADE—GROSS TONS.

Kinds of Pig Iron.	Gross Tons.
Total production of PIG IRON in the WHOLE YEAR 1906, excluding Spiegeleisen, Ferro-manganese, Ferro-phosphorus, and Ferro-Bessemer, but including castings made direct from the furnace	3628.1
☞ If the furnace changed hands *during this time* please estimate the quantity of pig iron produced by the previous operators.	
Production of FERRO-MANGANESE in the WHOLE YEAR 1906	
Production of SPIEGELEISEN in the WHOLE YEAR 1906	
Production of FERRO-PHOSPHORUS in the WHOLE YEAR 1906	
Production of FERRO-BESSEMER in the WHOLE YEAR 1906	
Total production of all kinds of Pig Iron, Spiegeleisen, Ferro-manganese, etc., in 1906	
How much of the TOTAL PRODUCTION in the WHOLE OF 1906 was—	
BESSEMER PIG IRON? (from 0.04 to 0.10 per cent. in Phosphorus) (Charcoal)	1159
LOW-PHOSPHORUS PIG IRON? (below 0.04 per cent. in Phosphorus)	
MALLEABLE BESSEMER PIG IRON?	
BASIC PIG IRON?	
~~FOUNDRY PIG IRON~~? Charcoal Pig Iron	25122
FORGE or MILL PIG IRON?	
FERRO-SILICON? (7 per cent. and over in Silicon)	
WHITE and MOTTLED and other miscellaneous grades of PIG IRON and CASTINGS made direct from the Furnace?	

IDLE FURNACES.

If you made no pig iron at all in the WHOLE YEAR 1906 please so state

Signature Cleveland Cliffs Iron Co.

H. M. J.

This blank is printed in copying ink for manufacturers who may desire to copy it in their letter books.

[STRICTLY CONFIDENTIAL]

☞ *Please fill out this blank and return it as soon as possible to The American Iron and Steel Association, No. 261 South Fourth Street, Philadelphia.*

Second Request. First Six Months.

PRODUCTION OF PIG IRON IN THE FIRST SIX MONTHS OF 1906.

FOR THE SIX MONTHS ENDED JUNE 30, 1906.

Name of Furnace or Furnaces, Pioneer
Name of Owners or Lessees, Cleveland Cliffs Iron Co.
Post Office, County, and State, 11th Floor Rockefeller Bldg. Cleveland Ohio

STACKS.

Number of completed Furnace Stacks, 1 | Stacks out of blast June 30, 1906, 0
Stacks in blast June 30, 1906, 1 | Stacks building June 30, 1906, None
How many DAYS in the FIRST HALF of 1906 was each furnace in blast? 181

Number of STACKS IDLE on June 30, 1906, and date when they may be blown in None

Number of STACKS IDLE on June 30, 1906, that will NEVER AGAIN MAKE PIG IRON None
Number of BUILDING STACKS on June 30, 1906, and the date when you expect to have each stack completed None
Number of REBUILDING STACKS on June 30, 1906, and the date when you expect to have each stack ready for blast. (If more than one stack please give name or No. of stack) None

If you contemplate erecting any NEW BLAST FURNACES in the LAST HALF of 1906 please give the number to be built, the size of each furnace, and the date when you expect to commence work upon each stack None

FUEL USED.

Kind of Fuel used in the FIRST SIX MONTHS of 1906, Charcoal.

Please state distinctly whether you used all coke, all raw bituminous coal, coke and raw coal mixed, all anthracite coal, anthracite coal and coke mixed, charcoal and coke mixed, or charcoal alone.

PIG IRON MADE—GROSS TONS.

KINDS OF PIG IRON.	GROSS TONS.
Total production of PIG IRON in the FIRST SIX MONTHS of 1906, excluding Spiegeleisen, Ferro-manganese, Ferro-phosphorus, and Ferro-Bessemer, but including castings made direct from the furnace	18405
☞ If the works changed hands *during this time* please estimate the quantity of pig iron produced by the previous operators.	
Production of FERRO-MANGANESE in the FIRST SIX MONTHS of 1906	
Production of SPIEGELEISEN in the FIRST SIX MONTHS of 1906	
Production of FERRO-PHOSPHORUS in the FIRST SIX MONTHS of 1906	
Production of FERRO-BESSEMER in the FIRST SIX MONTHS of 1906	
Total production of all kinds of Pig Iron, Spiegeleisen, Ferro-manganese, etc.	
How much of the TOTAL PRODUCTION in the FIRST HALF of 1906 was—	
BESSEMER PIG IRON? (from 0.04 to 0.10 per cent. in Phosphorus)	
LOW-PHOSPHORUS PIG IRON? (below 0.04 per cent. in Phosphorus)	
MALLEABLE BESSEMER PIG IRON?	
BASIC PIG IRON?	
~~FOUNDRY PIG IRON?~~ Charcoal Pig Iron.	18405
FORGE PIG IRON?	
FERRO-SILICON? (7 per cent. and over in Silicon)	
WHITE and MOTTLED and other miscellaneous grades of PIG IRON and CASTINGS made direct from the furnace?	

REMARKS.

Please note below any blast furnaces, rolling mills, steel works, tinplate or terne plate works, and forges or bloomaries which are projected or are being built in your vicinity. Also note any old plants of this character that have been recently abandoned or dismantled. If you are now making or intend making any changes in the equipment of your works please give full particulars below

IDLE PLANTS.

If you made no pig iron at all in the first six months of 1906 please so state

Signature The Cleveland-Cliffs Iron Co.

b

Second Request.

WHOLE YEAR.

This blank is printed in copying ink for manufacturers who may desire to copy it in their letter books.

[STRICTLY CONFIDENTIAL.]

☞ *Please fill out this blank for your furnaces and return it as early as possible to The American Iron and Steel Association, No. 261 South Fourth Street, Philadelphia.*

PRODUCTION OF PIG IRON IN 1906.

FOR THE YEAR ENDED DECEMBER 31, 1906.

Name of Furnace or Furnaces Pioneer No. 2

Name of Owners or Lessees Pioneer Iron Company

Post Office, County, and State 11th Floor Rockefeller Bldg Cleveland Ohio

STACKS.

Number of completed Furnace Stacks 1 | Stacks building December 31, 1906 None

Stacks in blast December 31, 1906 1 | Stacks rebuilding December 31, 1906 "

Stacks out of blast December 31, 1906 None | Stacks relining December 31, 1906 "

STACKS IN BLAST—How many DAYS in the LAST HALF of 1906 was each furnace in blast?

183 days

Furnace banked 10 days

IDLE STACKS—Date when STACKS IDLE on December 31, 1906, may be blown in None

ABANDONED STACKS—Number of STACKS IDLE on December 31, 1906, that will NEVER AGAIN MAKE PIG IRON. (Give name or No. of Stack) None

BUILDING STACKS—Date when STACKS BUILDING on December 31, 1906, will probably be completed None

REBUILDING STACKS—Date when you expect to have each REBUILDING STACK ready for blast. (If more than one Stack please give name or No. of Stack) None

RELINING STACKS—Date when you expect to have each RELINING STACK ready for blast None

PROJECTED STACKS—If you contemplate erecting any NEW STACKS in 1907 please give the number to be built, the size of each Stack, and the date when you expect to commence work upon each Stack None

LIMESTONE QUARRIED—GROSS TONS.

GROSS TONS.

How many tons of LIMESTONE did you QUARRY in the WHOLE YEAR 1906? None

How many tons of LIMESTONE did you CONSUME in your Furnaces in 1906? 3486

☞ If you can not conveniently give exact figures of the limestone quarried or consumed a CLOSE ESTIMATE will answer.

FUEL USED.

Kind of Fuel used in the WHOLE YEAR 1906, Charcoal

Please state distinctly whether you used all coke, all raw bituminous coal, coke and raw coal mixed, all anthracite coal, anthracite coal and coke mixed, charcoal and coke mixed, or charcoal alone.

PIG IRON MADE—GROSS TONS.

KINDS OF PIG IRON.	GROSS TONS.
Total production of PIG IRON in the WHOLE YEAR 1906, excluding Spiegeleisen, Ferro-manganese, Ferro-phosphorus, and Ferro-Bessemer, but including castings made direct from the furnace	36819
☞ If the furnace changed hands *during this time* please estimate the quantity of pig iron produced by the previous operators.	
Production of FERRO-MANGANESE in the WHOLE YEAR 1906	
Production of SPIEGELEISEN in the WHOLE YEAR 1906	
Production of FERRO-PHOSPHORUS in the WHOLE YEAR 1906	
Production of FERRO-BESSEMER in the WHOLE YEAR 1906	
Total production of all kinds of Pig Iron, Spiegeleisen, Ferro-manganese, etc., in 1906	
How much of the TOTAL PRODUCTION in the WHOLE OF 1906 was—	
BESSEMER PIG IRON? (from 0.04 to 0.10 per cent. in Phosphorus)	
LOW-PHOSPHORUS PIG IRON? (below 0.04 per cent. in Phosphorus)	
~~MALLEABLE BESSEMER PIG IRON~~? High Phosphorus Charcoal	667
~~BASIC PIG IRON~~? High " "	72
~~FOUNDRY PIG IRON~~? Charcoal Pig Iron	36080
FORGE or MILL PIG IRON?	
FERRO-SILICON? (7 per cent. and over in Silicon)	
WHITE and MOTTLED and other miscellaneous grades of PIG IRON and CASTINGS made direct from the Furnace?	

IDLE FURNACES.

If you made no pig iron at all in the WHOLE YEAR 1906 please so state

Signature Pioneer Iron Co. per M. Z.

This blank is printed in copying ink for manufacturers who may desire to copy it in their letter books.

Second Request. First Six Months.

[STRICTLY CONFIDENTIAL]

☞ *Please fill out this blank and return it as soon as possible to The American Iron and Steel Association, No. 261 South Fourth Street, Philadelphia.*

PRODUCTION OF PIG IRON IN THE FIRST SIX MONTHS OF 1906.

FOR THE SIX MONTHS ENDED JUNE 30, 1906.

Name of Furnace or Furnaces, Pioneer Furnace No. 2.
Name of Owners or Lessees, Pioneer Iron Co.
Post Office, County, and State, 11th Floor Rockefeller Bldg Cleveland Ohio.

STACKS.

Number of completed Furnace Stacks, 1 | Stacks out of blast June 30, 1906, 0
Stacks in blast June 30, 1906, 1 | Stacks building June 30, 1906, 0
How many DAYS in the FIRST HALF of 1906 was each furnace in blast? 171
Furnace banked 13 days on account of shortage of Wood
Number of STACKS IDLE on June 30, 1906, and date when they may be blown in None
Number of STACKS IDLE on June 30, 1906, that will NEVER AGAIN MAKE PIG IRON None
Number of BUILDING STACKS on June 30, 1906, and the date when you expect to have each stack completed None
Number of REBUILDING STACKS on June 30, 1906, and the date when you expect to have each stack ready for blast. (If more than one stack please give name or No. of stack) None
If you contemplate erecting any NEW BLAST FURNACES in the LAST HALF of 1906 please give the number to be built, the size of each furnace, and the date when you expect to commence work upon each stack None

FUEL USED.

Kind of Fuel used in the FIRST SIX MONTHS of 1906, Charcoal.

Please state distinctly whether you used all coke, all raw bituminous coal, coke and raw coal mixed, all anthracite coal, anthracite coal and coke mixed, charcoal and coke mixed, or charcoal alone.

PIG IRON MADE—GROSS TONS.

KINDS OF PIG IRON.	GROSS TONS.
Total production of PIG IRON in the FIRST SIX MONTHS of 1906, excluding Spiegeleisen, Ferro-manganese, Ferro-phosphorus, and Ferro-Bessemer, but including castings made direct from the furnace	17300
☞ If the works changed hands *during this time* please estimate the quantity of pig iron produced by the previous operators.	
Production of FERRO-MANGANESE in the FIRST SIX MONTHS of 1906	
Production of SPIEGELEISEN in the FIRST SIX MONTHS of 1906	
Production of FERRO-PHOSPHORUS in the FIRST SIX MONTHS of 1906	
Production of FERRO-BESSEMER in the FIRST SIX MONTHS of 1906	
Total production of all kinds of Pig Iron, Spiegeleisen, Ferro-manganese, etc.	
How much of the TOTAL PRODUCTION in the FIRST HALF of 1906 was—	
BESSEMER PIG IRON? (from 0.04 to 0.10 per cent. in Phosphorus)	
LOW-PHOSPHORUS PIG IRON? (below 0.04 per cent. in Phosphorus)	
MALLEABLE BESSEMER PIG IRON?	
BASIC PIG IRON?	
FOUNDRY PIG IRON? Charcoal Pig Iron	17300
FORGE PIG IRON?	
FERRO-SILICON? (7 per cent. and over in Silicon)	
WHITE and MOTTLED and other miscellaneous grades of PIG IRON and CASTINGS made direct from the furnace?	

REMARKS.

Please note below any blast furnaces, rolling mills, steel works, tinplate or terne plate works, and forges or bloomaries which are projected or are being built in your vicinity. Also note any old plants of this character that have been recently abandoned or dismantled. If you are now making or intend making any changes in the equipment of your works please give full particulars below

IDLE PLANTS.

If you made no pig iron at all in the first six months of 1906 please so state

Signature Pioneer Iron Co.

14

This blank is printed in copying ink for manufacturers who may desire to copy it in their letter books.

Second Request.

WHOLE YEAR.

[STRICTLY CONFIDENTIAL.]

☞ *Please fill out this blank for your furnaces and return it as early as possible to The American Iron and Steel Association, No. 261 South Fourth Street, Philadelphia.*

PRODUCTION OF PIG IRON IN 1906.

FOR THE YEAR ENDED DECEMBER 31, 1906.

Name of Furnace or Furnaces Carp

Name of Owners or Lessees Pioneer Iron Company

Post Office, County, and State 11th Floor Rockefeller Bldg. Cleveland Ohio

STACKS.

Number of completed Furnace Stacks	1	Stacks building December 31, 1906	None
Stacks in blast December 31, 1906	1	Stacks rebuilding December 31, 1906	"
Stacks out of blast December 31, 1906	None	Stacks relining December 31, 1906	"

STACKS IN BLAST—How many DAYS in the LAST HALF of 1906 was each furnace in blast?

183 Days

Furnace banked - 69 days

IDLE STACKS—Date when STACKS IDLE on December 31, 1906, may be blown in None

ABANDONED STACKS—Number of STACKS IDLE on December 31, 1906, that will NEVER AGAIN MAKE PIG IRON. (Give name or No. of Stack) None

BUILDING STACKS—Date when STACKS BUILDING on December 31, 1906, will probably be completed None

REBUILDING STACKS—Date when you expect to have each REBUILDING STACK ready for blast. (If more than one Stack please give name or No. of Stack) None

RELINING STACKS—Date when you expect to have each RELINING STACK ready for blast None

PROJECTED STACKS—If you contemplate erecting any NEW STACKS in 1907 please give the number to be built, the size of each Stack, and the date when you expect to commence work upon each Stack None

LIMESTONE QUARRIED—GROSS TONS.

GROSS TONS.

How many tons of LIMESTONE did you QUARRY in the WHOLE YEAR 1906? None

How many tons of LIMESTONE did you CONSUME in your Furnaces in 1906? 1189

☞ If you can not conveniently give exact figures of the limestone quarried or consumed a CLOSE ESTIMATE will answer.

FUEL USED.

Kind of Fuel used in the WHOLE YEAR 1906, Charcoal

Please state distinctly whether you used all coke, all raw bituminous coal, coke and raw coal mixed, all anthracite coal, anthracite coal and coke mixed, charcoal and coke mixed, or charcoal alone.

PIG IRON MADE—GROSS TONS.

KINDS OF PIG IRON.	GROSS TONS.
Total production of PIG IRON in the WHOLE YEAR 1906, excluding Spiegeleisen, Ferro-manganese, Ferro-phosphorus, and Ferro-Bessemer, but including castings made direct from the furnace	1506 8
☞ If the furnace changed hands *during this time* please estimate the quantity of pig iron produced by the previous operators.	
Production of FERRO-MANGANESE in the WHOLE YEAR 1906	
Production of SPIEGELEISEN in the WHOLE YEAR 1906	
Production of FERRO-PHOSPHORUS in the WHOLE YEAR 1906	
Production of FERRO-BESSEMER in the WHOLE YEAR 1906	
Total production of all kinds of Pig Iron, Spiegeleisen, Ferro-manganese, etc., in 1906	
How much of the TOTAL PRODUCTION in the WHOLE OF 1906 was—	
BESSEMER PIG IRON? (from 0.04 to 0.10 per cent. in Phosphorus)	
LOW-PHOSPHORUS PIG IRON? (below 0.04 per cent. in Phosphorus)	
MALLEABLE BESSEMER PIG IRON?	
BASIC PIG IRON?	
~~FOUNDRY PIG IRON~~? Charcoal Pig Iron	1506 8
FORGE or MILL PIG IRON?	
FERRO-SILICON? (7 per cent. and over in Silicon)	
WHITE and MOTTLED and other miscellaneous grades of PIG IRON and CASTINGS made direct from the Furnace?	

IDLE FURNACES.

If you made no pig iron at all in the WHOLE YEAR 1906 please so state

Signature Pioneer Iron Co.

K. M. J.

This blank is printed in copying ink for manufacturers who may desire to copy it in their letter books.

[STRICTLY CONFIDENTIAL.]

☞ *Please fill out this blank and return it as soon as possible to The American Iron and Steel Association, No. 261 South Fourth Street, Philadelphia.*

Second Request. First Six Months.

PRODUCTION OF PIG IRON IN THE FIRST SIX MONTHS OF 1906.

FOR THE SIX MONTHS ENDED JUNE 30, 1906.

Name of Furnace or Furnaces, Carp.
Name of Owners or Lessees, Pioneer Iron Co.
Post Office, County, and State, 11th floor Rockefeller Bldg Cleveland Ohio.

STACKS.

Number of completed Furnace Stacks, 1 | Stacks out of blast June 30, 1906, 0
Stacks in blast June 30, 1906, 1 | Stacks building June 30, 1906, 0
How many DAYS in the FIRST HALF of 1906 was each furnace in blast? 181
Furnace banked 15 days for repairs.
Number of STACKS IDLE on June 30, 1906, and date when they may be blown in None
Number of STACKS IDLE on June 30, 1906, that will NEVER AGAIN MAKE PIG IRON None
Number of BUILDING STACKS on June 30, 1906, and the date when you expect to have each stack completed None
Number of REBUILDING STACKS on June 30, 1906, and the date when you expect to have each stack ready for blast. (If more than one stack please give name or No. of stack) None
If you contemplate erecting any NEW BLAST FURNACES in the LAST HALF of 1906 please give the number to be built, the size of each furnace, and the date when you expect to commence work upon each stack None

FUEL USED.

Kind of Fuel used in the FIRST SIX MONTHS of 1906, Charcoal.

Please state distinctly whether you used all coke, all raw bituminous coal, coke and raw coal mixed, all anthracite coal, anthracite coal and coke mixed, charcoal and coke mixed, or charcoal alone.

PIG IRON MADE—GROSS TONS.

KINDS OF PIG IRON.	GROSS TONS.
Total production of PIG IRON in the FIRST SIX MONTHS of 1906, excluding Spiegeleisen, Ferro-manganese, Ferro-phosphorus, and Ferro-Bessemer, but including castings made direct from the furnace	9292
☞ If the works changed hands *during this time* please estimate the quantity of pig iron produced by the previous operators.	
Production of FERRO-MANGANESE in the FIRST SIX MONTHS of 1906	
Production of SPIEGELEISEN in the FIRST SIX MONTHS of 1906	
Production of FERRO-PHOSPHORUS in the FIRST SIX MONTHS of 1906	
Production of FERRO-BESSEMER in the FIRST SIX MONTHS of 1906	
Total production of all kinds of Pig Iron, Spiegeleisen, Ferro-manganese, etc.	
How much of the TOTAL PRODUCTION in the FIRST HALF of 1906 was—	
BESSEMER PIG IRON? (from 0.04 to 0.10 per cent. in Phosphorus)	
LOW-PHOSPHORUS PIG IRON? (below 0.04 per cent. in Phosphorus)	
MALLEABLE BESSEMER PIG IRON?	
BASIC PIG IRON?	
~~FOUNDRY PIG IRON?~~ Charcoal Pig Iron	9292
FORGE PIG IRON?	
FERRO-SILICON? (7 per cent. and over in Silicon)	
WHITE and MOTTLED and other miscellaneous grades of PIG IRON and CASTINGS made direct from the furnace?	

REMARKS.

Please note below any blast furnaces, rolling mills, steel works, tinplate or terne plate works, and forges or bloomaries which are projected or are being built in your vicinity. Also note any old plants of this character that have been recently abandoned or dismantled. If you are now making or intend making any changes in the equipment of your works please give full particulars below

IDLE PLANTS.

If you made no pig iron at all in the first six months of 1906 please so state

Signature Pioneer Iron Co.

15

In reply please refer to G.B.M. and date of this letter.

Address all communications to
"Director, U. S. Geological Survey,
Washington, D. C."

SUBJECT: Iron Ores

RECEIVED
DEC 27 1906

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

WASHINGTON, D. C. January 2, 1907.

Dear Sir:

It is with sincere regret that the Survey announces that Mr. John Birkinbine, engineer, Philadelphia, Pa., who for seventeen years has collected the iron-ore statistics for the annual official report, "Mineral Resources of the United States," has withdrawn from this work. It is gratifying to use this opportunity to emphasize the great appreciation by the Survey of the untiring fidelity with which he has carried on this work for this long period with only compensation for clerical assistance. Mr. Birkinbine was the first to compile general iron-ore statistics covering the entire United States, and it is due to his constant watchfulness and his exact knowledge of the iron-ore industry in all parts of the country that the results attained have become possible.

Like all other statistical inquiries of the Survey, the collection of iron-ore statistics will henceforth be carried on by the organization itself. Mr. Edwin C. Eckel has been designated for this purpose.

A card of inquiry is inclosed for the mine you represent, and you are requested, at your earliest convenience, to reply to each of the questions and to return the card in the accompanying envelop, which requires no postage.

Answers received from individuals, firms, or mining companies do not appear in the published reports. The figures you send will be considered CONFIDENTIAL, and will be used only in making up averages and totals for publication.

Please state in exact figures the total quantity of marketable iron ore mined or produced (not the quantity shipped) by your mine during the year ending December 31, 1906, also the value at the mine of the ore produced, and the stock on hand at the mine. If the exact figures can not be furnished, please give close approximations.

If a mine is abandoned, if operations are temporarily suspended, or if no stocks of ore are on hand, please so state on the card. If the mine was operated for but a portion of the year, returns should be made for such time with an explanatory note.

If new iron-ore mines have been opened or exploited in your vicinity during last year, or if mines which have been idle have resumed or are about to resume activity, kindly supply the names and post-office addresses of the proper persons from whom statistics can be obtained.

Any information concerning iron-ore mining which will add to the interest of the volume of Mineral Resurces will be welcomed. Published reports upon mineral properties are especially desired. The purpose of the United States Geological Survey in issuing this volume is to render practical assistance to those engaged in mining, and your prompt cooperation is asked in order that the statistics can be tabulated and the report issued at an earlier date than has heretofore been possible.

Very respectfully,

Chas. D. Walcott,

Director.

Office Copies

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	1	2	3	4	5	6
	Prod. 1905 Dec 31/30.	Deduct Dec 1905	Add- Dec 1906.	Net Total Calendar year 1906.	Sales f.o.b. at mine per statement in cc Jan 1907 annual	Value at sales prices column 5
Ashland.	338507	24152	24003	338158 ✓	3.101	1048627.95 ✓
Crosby.	120905		11020	131925 ✓	2.119	279549.07 ✓
Iron Belt.	1950		726	2676 ✓	2.09	5592.84 ✓
Irwinton	175352	10778	13550	178524 ✓	2.04	364188.96 ✓
Jackson.	5016			5066 ✓	1.88	9524.08 ✓
Lincoln.	76237	7325	6020	74932 ✓	3.107	232813.72 ✓
Cliffs Shaft.	273690	23261	19416	269845 ✓	2.711	731549.79 ✓
Austin	160049	7272	13368	166145 ✓	2.834	470854.93 ✓
Negaunee	251969	21304	18738	249403 ✓	2.906	724765.11 ✓
Lake.	569630	41069	39343	567904 ✓	2.627	1491883.51 ✓
Salisbury.	147741	10165	9841	147417 ✓	2.296	338469.00 ✓
Imperial	44			44	—	
Total.	2121252	145326	156025	2131951		5697819.16

Memorandum showing method of determining Calendar year 1906 Production -
+. Value of ore at Mine. {Sales value} as used in preparation of information returned to Dept of the Interior - U.S. Geological Survey - Dec 31 - 1906 -

MH W. 2/26/07.

No. 213 CONFIDENTIAL.

DEPARTMENT OF THE INTERIOR

UNITED STATES GEOLOGICAL SURVEY

STATISTICS OF IRON ORE IN 1906.

Please fill out replies to the following queries and return as promptly as possible in the inclosed envelop, which requires no postage. Only with your express permission will individual figures be disclosed; otherwise all replies are held strictly confidential, only State totals being published.

IRON ORE MINED during the year ending December 31, 1906, at the

Ogden
[Give name of mine.]

Located at J. H. Fleming

State MICHIGAN County Marquette

Owned by The Cleveland-Cliffs Iron Co

Information supplied by W. G. Mather

Closed
[Sign here, giving name, official position, and post-office address.]

A. Underscore character of iron ore produced, and if more than one of the following classes is mined give quantities of each: *Long tons.*

Limonite, brown hematite, or bog ore .....

Red hematite, specular or fossil ore ..... None

Magnetic ore .....

Carbonate or black band ore .....

Total quantity of marketable iron ore mined or produced during the year 1906 ..... None
[If none, so state.]

B. State stock of iron ore on hand at MINE December 31, 1906.
None long tons.
[If none, so state.]

C. Give total value on cars or carts AT THE MINE of the iron ore produced during the year ending December 31, 1906, royalty, if any, included, but exclusive of hauling to points of shipment or consumption. The gross commercial value of the ore at the mine, NOT the cost, is asked for.
$ Closed

D. Is there objection to the FIGURES OF OUTPUT ONLY being credited to your mine in the report when published?

Answer. .....

E. What was the average percentage of metallic iron in the ore mined during 1906? .....

25643b2500-10-06

[OVER.]

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No. 213 CONFIDENTIAL.

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

STATISTICS OF IRON ORE IN 1906.

Please fill out replies to the following queries and return as promptly as possible in the inclosed envelop, which requires no postage. Only with your express permission will individual figures be disclosed; otherwise all replies are held strictly confidential, only State totals being published.

IRON ORE MINED during the year ending December 31, 1906, at the

Cleveland Lake
[Give name of mine.]

Located at Ishpeming

State MICHIGAN. County Marquette

Owned by The Cleveland-Cliffs Iron Co.

Information supplied by W G M Pt

Cleveland O
[Sign here, giving name, official position, and post-office address.]

A. Underscore character of iron ore produced, and if more than one of the following classes is mined give quantities of each: *Long tons.*

Limonite, brown hematite, or bog ore	
Red hematite, specular or fossil ore	567,904
Magnetic ore	
Carbonate or black band ore	
Total quantity of marketable iron ore mined or produced during the year 1906 [If none, so state.]	567,904

B. State stock of iron ore on hand at MINE December 31, 1906. 32329 long tons.
[If none, so state.]

C. Give total value on cars or carts AT THE MINE of the iron ore produced during the year ending December 31, 1906, royalty, if any, included, but exclusive of hauling to points of shipment or consumption. The gross commercial value of the ore at the mine, NOT the cost, is asked for. $1,491,883.81

D. Is there objection to the FIGURES OF OUTPUT ONLY being credited to your mine in the report when published?

Answer.

E. What was the average percentage of metallic iron in the ore mined during 1906?

25643b2500-10-06 [OVER.]

No. 213 CONFIDENTIAL.

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

STATISTICS OF IRON ORE IN 1906.

Please fill out replies to the following queries and return as promptly as possible in the inclosed envelop, which requires no postage. Only with your express permission will individual figures be disclosed; otherwise all replies are held strictly confidential, only State totals being published.

IRON ORE MINED during the year ending December 31, 1906, at the

Jackson
[Give name of mine.]

Located at Negaunee

State MICHIGAN. County Marquette

Owned by The Cleveland-Cliffs Iron Co

Information supplied by W G M Pt

Cleveland O
[Sign here, giving name, official position, and post-office address.]

A. Underscore character of iron ore produced, and if more than one of the following classes is mined give quantities of each: *Long tons.*

Limonite, brown hematite, or bog ore	
Red hematite, specular or fossil ore	5066
Magnetic ore	
Carbonate or black band ore	
Total quantity of marketable iron ore mined or produced during the year 1906 [If none, so state.]	5066

B. State stock of iron ore on hand at MINE December 31, 1906. None long tons.
[If none, so state.]

C. Give total value on cars or carts AT THE MINE of the iron ore produced during the year ending December 31, 1906, royalty, if any, included, but exclusive of hauling to points of shipment or consumption. The gross commercial value of the ore at the mine, NOT the cost, is asked for. $9524.08

D. Is there objection to the FIGURES OF OUTPUT ONLY being credited to your mine in the report when published?

Answer.

E. What was the average percentage of metallic iron in the ore mined during 1906?

25643b2500-10-06 [OVER.]

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