

July 1, 1878, amount available.....	\$8,877 02	
Amount appropriated by act approved March 3, 1879.....	4,000 00	\$12,877 02
July 1, 1879, amount expended during fiscal year.....	2,547 35	
July 1, 1879, outstanding liabilities.....	3,763 90	6,311 25

July 1, 1879, amount available.....	6,565 77	
Amount (estimated) required for completion of existing project.....	40,536 58	
Amount that can be profitably expended in fiscal year ending June 30, 1881.....	20,000 00	

(See Appendix D D 2.)

3. *Improvement of Manistee Harbor, Michigan.*—Two cribs (50 by 24 feet), in extension of north pier, were placed last fall, and two in extension of south pier this spring. The superstructure is being placed thereon.

A scow loaded with brick sunk in the channel just at the close of navigation in the fall being a source of danger and an obstruction, was removed.

The channel has improved, and vessels drawing 10 feet of water now pass without trouble.

With the appropriation of March 3, 1879, it is intended to extend both piers 100 feet, and to dredge the channel.

The balance of the original estimate for pier extension is \$51,771; \$30,000 of this could be very profitably expended in the fiscal year ending June 30, 1881.

July 1, 1878, amount available.....	\$15,000 74	
Amount appropriated by act approved March 3, 1879.....	10,000 00	\$25,000 74
July 1, 1879, amount expended during fiscal year.....	6,512 87	
July 1, 1879, outstanding liabilities.....	5,107 93	11,620 80

July 1, 1879, amount available.....	13,379 94	
Amount (estimated) required for completion of existing project.....	51,771 00	
Amount that can be profitably expended in fiscal year ending June 30, 1881.....	30,000 00	

(See Appendix D D 3.)

4. *Improvement of Ludington Harbor, Michigan.*—Two cribs (each 50 by 24 feet) were added to the north pier last fall, and one crib (50 by 30 feet) to the south pier this spring. The superstructure will be completed over them this season.

Eighteen thousand seven hundred and twenty cubic yards of sand was dredged from the channel by the government apparatus in the fall, leaving a water way of about 16 feet. Owing to low water this season we have now a little over 13 feet.

With the appropriation of March 3, 1879, and a small balance in hand, it is intended to add one crib to each pier, extending them 50 feet.

The original plan was to provide for a depth of 14 feet of water. Now that 16 feet is demanded an additional extension of piers will be required; and the officer in charge thinks that \$17,602.07 could be profitably expended in this pier extension in the next fiscal year.

July 1, 1878, amount available.....	\$15,717 26	
Amount appropriated by act approved March 3, 1879.....	5,000 00	\$20,717 26
July 1, 1879, amount expended during fiscal year.....	10,491 63	
July 1, 1879, outstanding liabilities.....	1,344 15	11,835 78

July 1, 1879, amount available.....	8,881 48	
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Amount (estimated) required for completion of existing project.....	\$17,602 07	
Amount that can be profitably expended in fiscal year ending June 30, 1881, as revised in this office.....	10,000 00	

(See Appendix D D 4.)

5. *Improvement of Pentwater Harbor, Michigan.*—The season's work comprised the building of 600 linear feet of pile revetment on the north side of the channel, and some repairs to the piers and revetments in the way of refilling, in order to prevent the passage of sand into the channel. About 8 feet of water can now be carried through the channel.

The appropriation of March 3, 1879, will suffice to build 350 feet of revetment, carrying it through to the little lake, and to dredge the channel.

An unappropriated balance of \$23,200 remains of the original estimate of 1873. This amount can be profitably expended in the fiscal year ending June 30, 1881, in extending the piers.

July 1, 1878, amount available.....	\$10,744 75	
Amount appropriated by act approved March 3, 1879.....	6,000 00	\$16,744 75
July 1, 1879, amount expended during the fiscal year.....	9,899 91	
July 1, 1879, outstanding liabilities.....	250 00	10,149 91

July 1, 1879, amount available.....	6,594 84	
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Amount (estimated) required for completion of existing project.....	23,200 00	
Amount that can be profitably expended in fiscal year ending June 30, 1881, as revised in this office.....	10,000 00	

(See Appendix D D 5.)

6. *Improvement of White River Harbor, Michigan.*—The work at this harbor during the year covered the extension of the south pier 50 feet and refilling of the south side revetment for 398 feet, and some repairs.

This spring the United States dredging apparatus dredged the channel so as to give a water-way of 12 feet, 70 feet wide.

Two cribs (each 50 by 24 feet) will be placed in extension of the south pier, and the north revetment will be overhauled and refilled, with the appropriation of March 3, 1879.

The unappropriated balance of the original estimate, viz, \$12,391.56, for pier extension, and \$5,000 for dredging, can be profitably expended in the next fiscal year in continuing these improvements.

July 1, 1878, amount available.....	\$12,127 65	
Amount appropriated by act approved March 3, 1879.....	7,500 00	\$19,627 65
July 1, 1879, amount expended during fiscal year.....	9,359 14	
July 1, 1879, outstanding liabilities.....	2,124 68	11,483 82

July 1, 1879, amount available.....	8,143 83	
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Amount (estimated) required for completion of existing project.....	17,391 56	
Amount that can be profitably expended in fiscal year ending June 30, 1881.....	10,000 00	

(See Appendix D D 6.)

7. *Improvement of Muskegon Harbor, Michigan.*—The work of the year consisted in some minor repairs to the piers and revetments and a renewal of the superstructure over the north pier head.

With the appropriation of March 3, 1879, it is proposed to extend the north pier 50 feet.

The officer in charge reports a shoal to the north of the entrance that threatens to encroach upon the channel, and recommends an extension of the north pier 250 feet, at an estimated cost of \$19,901.75.

July 1, 1878, amount available	\$4,393 46	
Amount appropriated by act approved March 3, 1879	5,000 00	\$9,393 46
July 1, 1879, amount expended during fiscal year	2,091 07	
July 1, 1879, outstanding liabilities	160 00	2,251 07
July 1, 1879, amount available		7,142 39
Amount (estimated) required for completion of existing project		19,901 75
Amount that can be profitably expended in fiscal year ending June 30, 1881, as revised in this office		10,000 00

(See Appendix D D 7.)

8. *Improvement of Grand Haven Harbor, Michigan.*—Three cribs (each 50 by 30 feet) were added to the north pier last fall. Superstructure over these remains to be placed. Some open spaces in revetments were closed and minor repairs made.

A troublesome bar formed in the fall directly across the mouth of the harbor. This was so far removed by propellers that vessels continued to make the port during the winter, drawing 13½ feet. Fourteen feet is the best water over the bar at the present time of low water.

Willows have been planted (covering about two acres) near the beach where sand drifted over into the channel, and it is thought that by this means the sand may be prevented from drifting.

Another railroad has made its terminus here, and will augment the large traffic of the port, making it necessary that this harbor should be made safe and reliable at all times for the heavy class of vessels in the service of the lines interested, as well as for strangers seeking it as a harbor of refuge.

With the appropriation of March 3, 1879, it is intended to complete the north pier superstructure, to refill and ballast portions of the south side revetments, to tighten revetments at several points on both sides, and to extend the south pier 50 feet.

There remains unappropriated of estimates heretofore made \$20,148.96, which can be profitably expended in the fiscal year ending June 30, 1881, in pier extensions.

July 1, 1878, amount available	\$15,000 21	
Amount appropriated by act approved March 3, 1879	9,000 00	\$24,000 21
July 1, 1879, amount expended during fiscal year	21,194 78	
July 1, 1879, amount available	2,805 43	
Amount (estimated) required for completion of existing project		20,148 96
Amount that can be profitably expended in fiscal year ending June 30, 1881, as revised in this office		10,000 00

(See Appendix D D 8.)

9. *Improvement of Black Lake Harbor, Michigan.*—During the fiscal year a contract was made for extending the piers by 3 cribs. These have been built, and will be put in place this season. In addition, the contractor made some repairs to the revetments.

This spring the channel was found to be very shoal, and the necessity for immediate dredging having been represented as urgent, upon the recommendation of this office the appropriation of March 3, 1879, was made available therefor.

The dredging was nearly finished at the end of the fiscal year, so as to leave a navigable way of 11 feet. It is hoped that this will hold in future, as the revetments were believed to be impervious to the passage of sand.

The unappropriated balance of the original estimate, \$16,000, will not be sufficient to complete the extension of the piers to the required depth, 15 feet, and the officer in charge accordingly submits an estimate for their completion of \$28,547.32. In addition to this, the superstructure of the north pier needs renewing at an estimated cost of \$9,675.40, making the total amount required for pier extension and repairs \$37,833.40.

July 1, 1878, amount available	\$10,702 58	
Amount appropriated by act approved March 3, 1879	6,000 00	\$16,702 58
July 1, 1879, amount expended during fiscal year	4,723 32	
July 1, 1879, outstanding liabilities	7,785 62	12,508 94
July 1, 1879, amount available		4,193 64
Amount (estimated) required for completion of existing project		37,833 40
Amount that can be profitably expended in fiscal year ending June 30, 1881, as revised in this office		

(See Appendix D D 9.)

10. *Improvement of Saugatuck Harbor, Michigan.*—The work of the season consisted of thoroughly overhauling the south pier and refilling it with slabs and stone; cleaning out the north pier for a distance of 330 feet, and substituting a new filling of brush made into mattresses, heavily weighted with stone, and planking over a small portion of the pier-head. Both piers were left for the winter in excellent condition.

The channel is now obstructed by a bar across the mouth, so that steamers drawing only 8 feet can pass.

With the appropriation of March 3, 1879, it is proposed to dredge this away and to add a crib to the pier and close a break near the shore line.

The unappropriated balance of the original estimate for this work is \$30,958.74, to which should be added expenditures made from the appropriations of 1876, 1878, and 1879 for dredging and repairs not contemplated in the project, amounting to \$8,100, making the sum required for completion \$39,058.74, which the officer in charge states can be profitably expended during the next fiscal year.

July 1, 1878, amount available	\$2,505 33	
Amount appropriated by act approved March 3, 1879	5,000 00	\$7,505 33
July 1, 1879, amount expended during fiscal year	2,301 93	
July 1, 1879, outstanding liabilities	26 85	2,328 78
July 1, 1879, amount available		5,176 55
Amount (estimated) required for completion of existing projects		39,058 74
Amount that can be profitably expended in fiscal year ending June 30, 1881, as revised in this office		20,000 00

(See Appendix D D 10.)

11. *Improvement of South Haven Harbor, Michigan.*—During the fiscal year the inside channel has been widened and the revetment on the north side carried 461 feet eastwardly, which completed it. Some minor repairs were also put upon the piers.

The depth of water in the channel is 8½ feet.

Operations contemplated with the appropriation of March 3, 1879, embrace an extension of the north pier 100 feet and dredging a channel of 14 feet. This harbor requires further dredging, and the piers should be extended to deeper water; for which purpose the officer in charge estimates that \$25,000 can be profitably expended during the fiscal year ending June 30, 1881.

July 1, 1878, amount available.....	\$12,100 02	
Amount appropriated by act approved March 3, 1879.....	7,500 00	\$19,600 02
July 1, 1879, amount expended during fiscal year.....	7,978 61	
July 1, 1879, outstanding liabilities.....	1,375 75	9,354 36
July 1, 1879, amount available.....		10,245 66
Amount (estimated) required for completion of existing project.....		52,500 00
Amount that can be profitably expended in fiscal year ending June 30, 1881, as revised in this office.....		20,000 00

(See Appendix D D 11.)

12. *Improvement of Saint Joseph Harbor, Michigan.*—Some slight repairs have been made which left the piers in good condition for the winter. Two cribs were also built for extending the north pier. The contractor has placed one of these cribs and expects this season to place the other and complete the work of this contract.

The United States dredging apparatus was employed in clearing away a bar from the mouth of the harbor. This at the close of the fiscal year was nearly completed, so that vessels drawing 13½ feet could enter.

The wing-dam built five years ago at the mouth of canal to Benton Harbor serves its purpose well, and it is hoped that with the funds now available it may be refilled and lengthened.

For continuing improvements of Saint Joseph Harbor and River the officer in charge submits an estimate of \$13,216.71.

July 1, 1878, amount available.....	\$14,059 78	
Amount appropriated by act approved March 3, 1879.....	6,900 00	\$20,059 78
July 1, 1879, amount expended during fiscal year.....	2,975 18	
July 1, 1879, outstanding liabilities.....	6,481 03	9,456 21
July 1, 1879, amount available.....		10,603 57
Amount (estimated) required for completion of existing project.....		13,216 71
Amount that can be profitably expended in fiscal year ending June 30, 1881.....		13,200 00

(See Appendix D D 12.)

13. *Harbor of Refuge, Portage Lake, Manistee County, Michigan.*—The river and harbor act of June 18, 1878, made provision for a survey of Portage Lake, Michigan, with estimates of cost of improvement proper to be made, with a view to its adaptability as a harbor of refuge.

In compliance therewith, a report was transmitted to Congress in January last suggesting that Portage Lake might be utilized as a harbor of refuge by making a suitable artificial entrance into it from Lake Michigan at a probable cost of \$189,860.

The dimensions adopted were a width of 300 feet between revetments of piles and piers of crib-work, and a depth of channel of 18 feet, so as to provide for the probable future wants of commerce.

The river and harbor act of March 3, 1879, appropriated \$10,000 for this work, and the officer in charge estimates that a further sum of \$75,000 can be profitably expended during the fiscal year ending June 30, 1881, in carrying out this plan.

Amount appropriated by act approved March 3, 1879.....	\$10,000 00	
July 1, 1879, amount available.....	10,000 00	
Amount (estimated) required for completion of existing project.....		179,860 00
Amount that can be profitably expended in fiscal year ending June 30, 1881, as revised in this office.....		30,000 00

(See Appendix D D 13.)

EXAMINATIONS AND SURVEYS FOR IMPROVEMENT.

To comply with the provisions of the river and harbor act of June 18, 1878, Major Mansfield was charged with survey of *Portage Lake, Manistee County, Michigan, with a view to its adaptability as a harbor of refuge*, the results of which were transmitted to Congress in January last and printed as Senate Ex. Doc. No. 24, Forty-fifth Congress, third session. (See also Appendix D D 13.)

And to comply with the provisions of the river and harbor act of March 3, 1879, he has been charged with and is now engaged upon survey of *Saint Joseph River, from its mouth, in Michigan, to Elkhart, Indiana, including channel leading up to Benton Harbor*, the results of which will be duly submitted when received.

IMPROVEMENT OF SAINT MARY'S FALLS CANAL—CONSTRUCTION OF HARBOR OF REFUGE ON LAKE HURON—IMPROVEMENT OF DETROIT RIVER.

Officer in charge, Maj. G. Weitzel, Corps of Engineers, with Capt. Alexander Mackenzie, Corps of Engineers, under his immediate orders.

1. *Improvement of Saint Mary's Falls Canal, Michigan.*—During the year 9,779 cubic yards of masonry have been laid and 4,417 cubic yards of earth-filling placed behind the walls of the new lock; 79,767 cubic feet of cut stone received; 28,417 cubic yards of earth and bowlders dredged for straightening the head of the canal; 16,657 cubic feet of timber received; 375 linear feet of the crib-work for the new south pier at the head of the canal built and superstructure begun, and 5,567 barrels of cement received.

It is deemed that the best interests of the entire commerce of the lakes will be promoted by having this great public improvement, when finished, pass under the immediate control and supervision of the general government.

For an economical and rapid prosecution of the work to completion \$195,000 should be appropriated for the fiscal year ending June 30, 1881.

July 1, 1878, amount available.....	\$344,668 62	
Miscellaneous receipts.....	45 37	
Amount appropriated by act approved March 3, 1879.....	300,000 00	\$644,713 99
July 1, 1879, amount expended during fiscal year.....		208,886 31
July 1, 1879, amount available.....		435,827 68

Amount (estimated) required for completion of existing project.....	195,000 00	
Amount that can be profitably expended in fiscal year ending June 30, 1881.....	195,000 00	

(See Appendix E E 1.)

2. *Construction of harbor of refuge, Lake Huron, Michigan.*—During the past year the superstructure of the five cribs which were in place was completed; the bottom for several of the following cribs was partly prepared and a small amount of dredging was done; 586,798 feet, board measure, of timber and plank, 49,698 pounds of iron, and 1,934 cords of stone were consumed.

The officer in charge again calls attention to the necessity of some enactment by Congress for the government and control of this harbor, as well for the protection of vessels taking refuge therein as for that of the work itself.

It is estimated by the officer in charge that \$155,000 will be required to complete the work, and this sum can be profitably expended during the fiscal year ending June 30, 1881.

July 1, 1878, amount available.....	\$103,665 35
Amount appropriated by act approved March 3, 1879.....	75,000 00
	<u>\$178,665 35</u>
July 1, 1879, amount expended during fiscal year.....	27,874 24
July 1, 1879, amount available.....	150,791 11
Amount (estimated) required for completion of existing project.....	155,000 00
Amount that can be profitably expended in fiscal year ending June 30, 1881.....	155,000 00

(See Appendix E E 2.)

3. *Improvement of Detroit River, Michigan.*—During the past year this work has been carried on under the appropriation of \$100,000 made by the act of June 18, 1878.

The drilling and blasting has been done over an area of 90,000 square feet, containing 7,134 cubic yards of rock, prism measurement; 3,262 cubic yards of this have been removed by the dredge. It has been found that the quantities of rock to be excavated from this reef at the Lime-Kiln Crossing is greater than estimated.

The officer in charge reports that it will require \$250,000 to complete the work, and a rapid and economical completion of the work requires that this whole amount should be appropriated at once.

July 1, 1878, amount available.....	\$100,000 00
Amount appropriated by act approved March 3, 1879.....	50,000 00
	<u>\$150,000 00</u>
July 1, 1879, amount expended during fiscal year.....	18,873 65
July 1, 1879, amount available.....	131,126 35
Amount (estimated) required for completion of existing project.....	250,000 00
Amount that can be profitably expended in fiscal year ending June 30, 1881, as revised in this office.....	150,000 00

(See Appendix E E 3.)

EXAMINATIONS AND SURVEYS FOR IMPROVEMENT.

To comply with the provisions of the river and harbor act of March 3, 1879, Major Weitzel has been charged with, and is now engaged upon, survey of approaches from Lake Superior to Saint Mary's Falls Ship Canal for a sixteen-foot channel, the results of which will be duly submitted when received.

REPAIR AND PRESERVATION OF SAINT CLAIR FLATS CANAL—IMPROVEMENT OF SAGINAW RIVER AND OF CERTAIN HARBORS ON LAKE HURON.

Officer in charge, Maj. Franklin Harwood, Corps of Engineers.

1. *Saint Clair Flats Canal.*—The heads of the canal banks were secured by pile protection and other minor repairs were made. The officer in charge submits, in his annual report, a project for a constant revenue for the maintenance of the canal by tax on passing vessels.

During the next fiscal year \$5,000 can be profitably expended in repairs and for the maintenance of the canal.

July 1, 1878, amount available.....	\$5,000 00
Amount appropriated by act approved March 3, 1879.....	3,000 00
	<u>\$8,000 00</u>
July 1, 1879, amount expended during fiscal year.....	4,111 56
July 1, 1879, amount available.....	3,888 44
Amount (estimated) required for completion of existing project.....	5,000 00
Amount that can be profitably expended in fiscal year ending June 30, 1881.....	5,000 00

(See Appendix F F 1.)

2. *Improvement of Saint Clair River at mouth of Black River, Michigan.*—The dredging of the Port Huron middle ground was completed to give 15 feet soundings over it. Slight shoaling exists below, but does not impede navigation. No further appropriation is required.

July 1, 1878, amount available.....	\$1,500 00
July 1, 1879, amount expended during fiscal year.....	1,500 00

(See Appendix F F 2.)

3. *Improvement of Au Sable River Harbor, Michigan.*—Jurisdiction over river and harbor banks for the purpose of improvement having been conceded to the United States, a project for restoration of the harbor and improvement of harbor and river has been determined and will be begun under the appropriation of March 3, 1879.

July 1, 1878, amount available.....	\$620 11
Amount appropriated by act approved March 3, 1879.....	7,000 00
	<u>\$7,620 11</u>
July 1, 1879, amount expended during fiscal year.....	207 75
July 1, 1879, amount available.....	7,412 36
Amount (estimated) required for completion of existing project.....	18,000 00
Amount that can be profitably expended in fiscal year ending June 30, 1881, as revised in this office.....	10,000 00

(See Appendix F F 3.)

4. *Improvement of Saginaw River, Michigan.*—During the year the Carrollton improvement was completed and a deflecting wing-dam at Zilwaukie Bar was built. The Carrollton channel is being further protected by a training wall on the bar. Full surveys for further improvements have been made, upon which the existing appropriation will be expended.

July 1, 1878, amount available.....	\$25,000 00
Amount appropriated by act approved March 3, 1879.....	8,000 00
	<u>\$33,000 00</u>
July 1, 1879, amount expended during fiscal year.....	14,627 70
July 1, 1879, outstanding liabilities.....	1,668 32
	<u>16,296 02</u>
July 1, 1879, amount available.....	16,703 98
Amount (estimated) required for completion of existing project.....	17,000 00
Amount that can be profitably expended in fiscal year ending June 30, 1881, as revised in this office.....	10,000 00

(See Appendix F F 4.)

5. *Improvement of Cheboygan Harbor, Michigan.*—The channel for a width of 200 feet and depth of 13 feet was finished during the fiscal year, excepting a small remainder, which can be dredged with the appropriation of March 3, 1879. Additional dredging about the axis of the channel and a protecting pier on the westerly border are contemplated.

July 1, 1878, amount available.....	\$8,000 00
Amount appropriated by act approved March 3, 1879.....	3,000 00
	<u>\$11,000 00</u>
July 1, 1879, amount expended during fiscal year.....	7,950 40
July 1, 1879, outstanding liabilities.....	16 55
	<u>7,966 95</u>
July 1, 1879, amount available.....	3,033 05
Amount (estimated) required for completion of existing project.....	\$25,000 00
Amount that can be profitably expended in fiscal year ending June 30, 1881, as revised in this office.....	15,000 00

(See Appendix F F 5.)

EXAMINATIONS AND SURVEYS FOR IMPROVEMENT.

To comply with the provisions of the river and harbor act of March 3, 1879, Major Harwood has been charged with, and is now engaged upon, examinations and surveys in the following localities, the results of which will be duly submitted when received:

1. Breakwater at Mackinac, Michigan.
2. Resurvey of Sebewaing Harbor, Michigan.
3. Resurvey of bar at mouth of Bell River, Michigan.
4. Resurvey of Clinton River, Michigan.

IMPROVEMENT OF HARBORS ON LAKE ERIE WEST OF DUNKIRK.

Officer in charge, Maj. John M. Wilson, Corps of Engineers, with Capt. M. B. Adams, Corps of Engineers, under his immediate orders.

Major Wilson relieved Lieutenant-Colonel Michler, Corps of Engineers, of charge of harbors on Lake Erie west of Cleveland, and Major McFarland, Corps of Engineers, of the charge of that of Cleveland, and of those between that point and Dunkirk, in December, 1878.

1. *Improvement of Monroe Harbor, Michigan.*—During the fiscal year both piers have been thoroughly repaired and 612 linear feet of revetment of the United States Canal renewed.

One thousand linear feet of the revetment of the United States Canal, and 1,850 feet of that of the Monroe City Canal, require to be renewed, and the channel should be dredged so as to admit the passage of vessels drawing 9 feet of water.

July 1, 1878, amount available	\$2,500 00	
Amount appropriated by act approved March 3, 1879	2,000 00	\$4,500 00
July 1, 1879, amount expended during fiscal year		2,488 56
July 1, 1879, amount available		2,011 44
Amount (estimated) required for completion of existing project	10,037 00	
Amount that can be profitably expended in fiscal year ending June 30, 1881 ..	10,000 00	

(See Appendixes G G 1 and G G 8.)

2. *Improvement of Toledo Harbor, Ohio.*—The work of dredging the natural channel through Maumee Bay to a depth of 15 feet, in accordance with a plan of the Board of Engineers, has been in progress during the year under contract; five dredges have been engaged upon the work, and 381,828 cubic yards of clay, mud, and sand have been removed. The present project is now nearly completed, and the engineer in charge recommends, on account of the rapidly increasing commerce of Toledo, that the depth in the channel be increased to 16 feet; the estimated cost for this increased depth is reported as \$100,000.

Work will be continued during the present season, excavating in the natural channel through Maumee Bay.

July 1, 1878, amount available	\$50,376 35	
Amount appropriated by act approved March 3, 1879	20,000 00	\$70,376 35
July 1, 1879, amount expended during fiscal year	42,698 47	
July 1, 1879, outstanding liabilities	1,767 63	
		44,466 10
July 1, 1879, amount available		25,910 25
Amount (estimated) required for completion of existing project	30,000 00	
Amount that can be profitably expended in fiscal year ending June 30, 1881 ..	30,000 00	

(See Appendixes G G 2 and G G 9.)

3. *Improvement of Port Clinton Harbor, Ohio.*—During the year the west revetment has been extended 300 feet and the east revetment 205 feet; the gap, 150 feet wide in the east revetment, has been closed. A channel about 2,000 feet long, 60 feet wide, and 10 feet deep has been opened by removing 19,487 cubic yards of sand, mud, &c.; the outer end of this channel was closed during the winter of 1878 by a bar which was removed.

During the present season it is proposed to extend the west revetment 300 feet and the east revetment 400 feet. Under the present project there will still remain 500 feet of the west pier and 850 feet of the east revetment to be built, and the channel to be dredged 150 feet wide.

July 1, 1878, amount available	\$10,008 43	
Amount appropriated by act approved March 3, 1879	10,000 00	\$20,008 43
July 1, 1879, amount expended during fiscal year		9,807 93
July 1, 1879, amount available		10,200 50
Amount (estimated) required for completion of existing project	55,000 00	
Amount that can be profitably expended in fiscal year ending June 30, 1881, as revised in this office	10,000 00	

(See Appendixes G G 3 and G G 10.)

4. *Improvement of Sandusky Harbor, Ohio.*—Operations have been in progress during the year dredging under contract in the natural channel through the bay and through the outer bar.

A channel 175 feet wide and 15 feet deep has been completed on the illuminated clock range; 132,973 cubic yards of clay, mud, and sand have been removed from the channel during the year.

During the present season it is proposed to continue dredging, as far as funds will admit, the channel through the outer bar. There is now a good channel, with a depth of 15 feet, from the deep water in the lake to a point about 400 feet from the line of docks.

The engineer in charge suggests the propriety of continuing the channel to a point within 100 feet of the line of docks and thence parallel to said docks.

July 1, 1878, amount available	\$22,905 10	
Amount appropriated by act approved March 3, 1879	1,000 00	\$23,905 10
July 1, 1879, amount expended during fiscal year	21,331 71	
July 1, 1879, outstanding liabilities	378 58	
		21,710 29
July 1, 1879, amount available		2,194 81
Amount (estimated) required for completion of existing project	20,000 00	
Amount that can be profitably expended in fiscal year ending June 30, 1881 ..	20,000 00	

(See Appendixes G G 4 and G G 11.)

5. *Improvement of Huron Harbor, Ohio.*—Work during the fiscal year has been confined to such minor repairs to the piers as were necessary.

The superstructure of both piers will soon require renewal, and the breakwater at the inner end of the west pier should be rebuilt.

During the present season such minor repairs will be made to the piers as may be found necessary.

July 1, 1878, amount available	\$1,189 17	
July 1, 1879, amount expended during fiscal year	361 30	
July 1, 1879, amount available		827 87
Amount (estimated) required for completion of existing project	25,000 00	
Amount that can be profitably expended in fiscal year ending June 30, 1881 ..	8,000 00	

(See Appendixes G G 5 and G G 12.)