The ordinary pile driver crew was composed of men as follows :—

Foreman, $0.58¾ per hour .... $ 4.80
1 engine runner, $0.55 per hour........... 4.40
1 fireman, $0.37½ per hour 3.00
1 winchman, $0.45 per hour 3.60
1 leadsman, $0.45 per hour 3.60
3 groundmen or deckhands, $0.40 per hour.. 9.60
1 coal passer, $0.25 per hour 2.00
1 pile hooker and trimmer, $0.37½ per hour 3.00

Total labor of crew $34.00
Auxiliaries, 6 men 15.00
Proportion of pumping station labor, supplying water for jetting 2.00
Field superintendence 2.75

Total labor $53.75

Marine Pile Driving.—The marine pile driving, as given in Table III was all within a protected harbor shielded from the heavy waves of the open lake, so but little time was lost by rough seas. In the delivering of piles from cars to scows, a large part of the labor was done by steam devices, but it is considered as being equal to the expense of six men all of the time the marine driving was going on. The soil was sandy for a few feet and below that it consisted of a moderately soft clay. The piles stood out of the water on an average of 12 ft. per pile, undriven. A tug was occupied about one-third of a day per driver in towing out and back to the yard. A drop hammer of 3,500 lbs. weight was generally used, being attached continuously to the hoisting rope. Each driver had two scows for piles, one on the work and one at the yard being loaded with piles.

TABLE III.—MARINE PILE DRIVING BY GREAT LAKES DREDGE & DOCK COMPANY.

Number of piles driven 9,896
Length of piles driven .... 326,295 lin. ft.
Length of pile penetration .... 207,816 lin. ft.
Average of piles .... 33 lin. ft.
Average of piles driven .... 21 lin. ft.
Total days' work and driver 137
Piles per day work and driver.......... 72.2
Piles per day work and driver.......... 2,380 lin. ft.
Penetration per day work and driver.... 1,516 lin. ft.
Crew of driver .... 10 men
Auxiliaries driver .... 6 men

Total men per driver .... 16 men

Total crew time .... 1,370 days
Total auxiliaries time .... 822 days

Total .... 2,192 days
Pay roll per day:
Tug service $15.00
Crew 34.00
Auxiliaries 19.75

Total $68.75

Costs	Lin. ft. of piling.	Lin. ft. of penetration.
Labor	$0.029	$0.0453
Supplies and repairs	*0.015	*0.0235
Piles	*0.125	*0.1962
Total "field" expense	$0.169	$0.265

* Estimate.

Foundation Pits.—Triple lap sheeting was driven for three foundation pits. The upper 15 ft. of ground is sand, below which is a soft clay. Through the sand, driving was assisted by using a water jet. The expense of this work is given in Table IV.

TABLE IV.—FOUNDATION SHEET PILE DRIVING.

Piling driven, pieces 405
Piling driven, lin. ft. 9,291
Piling driven, ft. B.M. 83,622
Moving out and off job, 5 days.......... $227.50
Driving, 19 days 679.00

Total, 24 days $906.50

Unit Cost of Labor—
$ 2.24 per pile.
0.098 per lin. ft.
10.84 per M. ft. B.M.

Two No. 1 Vulcan steam hammer drivers were used. Hence the item of moving on and off the work was somewhat high. The average rate of pay per man per 8-hour day was $3.50; including men nailing the sheeting planks together, the average size of crew per machine was from ten to twelve men. Including supplies and repairs, the expense per machine per day was approximately $50.00, whereas the labor as above given amounted to $37.77 per day.

At the same place 717 pieces of 9-in. by 12 in. 28 ft. triple-lap sheeting were driven. This formed a subaqueous front of a concrete-topped wharf. Table No. V. gives the cost of this work.

TABLE V.—WHARF SHEET PILING.—TIME OCCUPIED IN THE WORK, 29½ DAYS.

Piling driven—
405 pieces.
14,340 ft. driven in ground.
180,784 ft. B.M. of lumber
Towing, ⅓ of cost of 30 days at $10.... $ 300.00
Making sheeting, 75 days at $3 .... 225.00
Driving, 285 days at $3.50 .... 997.50
Pulling, 10 days at $3.50 .... 35.00

Total, 370 days $1,557.50
Labor cost per piece 2.17
Labor cost per lin. ft. driven 0.109
Labor cost per 1,000 ft. B.M. 8.62

TREE CUTTING UP-TO-DATE.

For some time it has been known that a wire drawn tight and heated by an electric current red hot would cut its way through a thick tree. Mr. Hugo Gautke, a German inventor, has improved this process by causing the wire to become incandescent simply by friction in working its way through a tree. A steel wire one twenty-fifth of an inch in diameter is used, and it is said that this can be made to traverse a tree twenty inches in diameter in six minutes. The wire is worked to and fro rapidly by an electric motor and becomes so hot by friction that it burns its way quickly through the trunk. The wire will cut through the tree without the use of wedges to keep the cut open, and the cut may be made several feet up the tree, on the ground level, or even below the ground.