

Ans'd
4/8



* City Engineer's Office, *

CITY HALL,

W. E. McClINTOCK,
City Engineer.

Chelsea, Mass., April 8 1889

Henry H. Gilmore Esq.
Cambridge Mass;

Dear Sir:-

I send this mail
my last report which gives what
information you ask, in the main.

We paid for quarrying and
stone 75¢ per ton and for
hauling 25¢ per ton which
leaves the actual cost of breaking
 $25\frac{6}{10}$ ¢ per ton. This is the average
cost per ton for 3850 tons

Respectfully

W. E. McClintock

City Engr.

ANNUAL REPORT

OF THE

◁CITY * ENGINEER,▷

OF THE

CITY OF CHELSEA,

MASSACHUSETTS,

FOR THE YEAR ENDING DEC. 31, 1888.



CHELSEA, MASS.:

H. MASON & SON, PRINTERS, WINNISIMMET ST.,
1889.

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REPORT OF THE CITY ENGINEER.

TO THE HONORABLE CITY COUNCIL :

Gentlemen :—I have the honor to submit my tenth annual report of operations in this department for the year 1888. The survey of city and making assessors' plans have progressed favorably during the year. That section of the city along Chelsea Creek has been completed down to Meridian street bridge. On the creek both sides were included in order to obtain a correct survey of the depth of the water.

There have been given during the year, 559 permits as follows: For new buildings, 52 ; for repairing buildings, 117 ; for general purposes, 202 ; for laying new drains, 134 ; for repairing old drains, 54. The character of work is about the same as on previous years, except that considerable work was put in to locate streets and place stone bounds for holding street lines once properly determined. There were located and set 34 monuments in this way.

Following is a summary of the expenses in the office for 1888 :

Salaries,	\$2,930 00	
Stationery,	40 05	
Drawing material,	55 87	
Instruments and repairs,	36 60	
Sundry small expenses,	94 3	
Printing letter heads, etc.,	25 25	
		\$3,182

The following tables show what has been done during the year, as far as the work could be classified :

SURVEYS AND LEVELS FOR 1888.

STREETS.	FROM	TO.	LEVELS.	OBJECT OF SURVEY.
Addison,	Carmel,	Cypress,	Levels,	Survey city.
Arlington,	Williams,	Fourth,		Street line.
Arlington,	Fourth,	Heard,	Levels,	Survey city.
Ash,	Williams,	Second,		Street line.
Beech,	Arlington,	Cypress,	Levels,	Survey city.
Bloomingsdale,	Spruce,	Carter,		Survey city.
Blossom,	Eden,	Cypress,	Levels,	Survey city.
Blossom,	Eden,	Spruce,		Street line.
Broadway,	Cary ave.,		Levels,	Survey city.
Broadway,	Woodlawn ave.,			Survey city.
Broadway,	Cr. Gerrish av.,		Levels,	Stone monument.
Broadway,	B. & M. R. R.,	Wash. ave.,		Survey city.
Carmel,	Wash. ave.,	Addison,	Levels,	Survey city.
Carter,	Wash. ave.,	Cypress,		Survey city.
Carroll,	Eastern ave.	Marginal,	Levels,	Street line.
Cary ave.,	Cor. Broadway			Survey city.
Cary ave.,	Spencer ave.,	Broadway,	Levels,	Street line.
Cary ave.,	Crescent ave.,	Broadway,		Street line.
Charles,	Marginal,	Suffolk,	Levels,	Survey city.
Cheever,	Wash. ave.,			Street line.
Chestnut,	B. & M. R. R.,	Library,	Levels,	Survey city.
Chestnut,	Second,	Third,		Street line.
Clark ave.,	Cor. Crest av.,		Levels,	Stone bound.
Clinton,	Eastern ave.,			Street line.
Congress ave.	Park,	Marginal,	Levels,	Street line.
Cottage,	Willow,	Hawthorn,		Street line.
County ave.,	Wash. ave.,	Gr'd junc. R.R.	Levels,	Town bound.
Crescent ave.,	Wash. ave.,	Everett line,		Dell lot.
Crescent ave.,	Cary ave.	Broadway,	Levels,	Grade.
Crescent ave.,	Cor. Br'dway,	Parker,		Survey city.
Crest ave.,	Clark ave.,	Reservoir,	Levels,	Grade.
Cypress,	Orange,	Fourth,		Survey city.
Eden,	Cor. Blossom,		Levels,	Survey city.
Essex,	Shurtleff,	Hawthorn,		City property,
Eustis,	Warren,	Harvard,	Levels,	Old Hospital.
Everett ave.,	Broadway,	Chestnut,		Poor house lot.
Everett ave.,	Spruce,	Everett line,	Levels,	Grade.
Fifth,	Arlington,	Cypress,		Survey city.
Fourth,	Arlington,	Cypress,	Levels,	Survey city.
Franklin ave.,	Warren ave.,			Survey city.
Franklin st.,	Warren st.,		Levels,	Intersection.
Gerrish ave.,	Broadway,			Survey city.
Hancock,	Wash'gton av.	Franklin,	Levels,	Survey city.
Hawthorn,	Bellingham,	Central ave.,		Street line.
Hawthorn,	Congress ave.,	Park,	Levels,	Pumping station.
Heard,	Eden,	Spruce,		Street line.
Heard,	Cor. Eden,		Levels,	Survey city.
Heard,	Arlington,	Cypress,		Survey city.
Hooper,	Cor. East'n av.,		Levels,	Stone bound.
Jefferson ave.,	Woodlawn av.,	Murray,		Survey city.
John,	Gardner,	Clark,	Levels,	Examinat'n sewer.
John,	Gardner,	Clark,		Survey city.
Maple,	Fourth,	Addison,	Levels,	Survey city.
Marginal,	Shawmut,	Charles,		Survey city.
Orange,	Spruce,	Carter,	Levels,	Survey city.
Park ave.,	Eleanor,	Crest ave.,		Grade.
Parker,	Cor. Clark av.,		Levels,	Survey city.
Parker,	Cor. Sturgis,			Survey city.
Park,	Congress ave.,	Hawthorn,	Levels,	Pumping station.
Pearl,	Congress ave.,	Hawthorn,		Street line.
Poplar,	Fifth,	Sixth,	Levels,	Grade.
Second,	Broadway,	Locust,		Street line.
Sixth,	Arlington,	Cypress,	Levels,	Survey city.
Spencer ave.,	Cor. Cary ave.,			Street line.
Spencer ave.,	Eleanor,	Woodlawn av.,	Levels,	Grading street.
Spencer ave.,	No. 100,	No. 116,		Grading sidewalk.

REPORT OF THE CITY ENGINEER.

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SURVEYS AND LEVELS FOR 1888,—(Continued.)

STREETS.	FROM	TO.	LEVELS.	OBJECT OF SURVEY.
Spencer ave.,	Eleanor.	Woodlawn av.,		Survey city.
Spruce	Fourth,	Wash'gton av.,		Survey city.
Third,	Broadway,	Chestnut,		Street line.
Vale,	Arlington,	Cypress,		Survey city.
Warren,	Eustis,	Franklin,		Poor house lot.
Wash. ave.,	Spruce,	Carter,		Survey city.
Wash. ave.,	Cor. Forsyth,			J. H. Wilkinson lot.
West Third,	Arlington,	Spruce,	Levels,	Grading street.
West Third,	Locust,			Stone bound.
West Third,	Cypress,			Stone bound.
West Third,	Maple,			Stone bound.
West Third,	Spruce,			Stone bound.
West Third,	Arlington,	Spruce,		Survey city.
Willard,	Eleanor,	Crest,	Levels,	Grading street.
Woodl'wn ave,	Dudley,	Clark ave.	Levels,	Line.
Woodl'wn ave,	Clark ave.,	Jefferson ave.,		Street line.
Woodl'wn ave,	Summit ave.,		Levels,	Stone bound.

LINES AND GRADES.—EDGE STONES, 1888.

STREET.	FROM	TO.	DATE.
Broadway.	No. 583,	B. & M. R. R. Bridge,	Oct. 30.
Broadway,	No. 819,	Eleanor,	March 30.
Broadway,	No. 799,	Eleanor,	March 30.
Central ave.,	Shurtleff,	Shawmut,	July 25.
Crescent ave.,	Washington ave.,	Tudor,	Oct. 25.
Eleanor,	811 Broadway,	110 feet south-east,	March 30.
Eleanor,	803 Broadway,	106 feet south-east,	March 30.
Essex,	Shurtleff,	Hawthorn,	Nov. 9.
Franklin ave.,	Warren ave.,	96 feet south-east,	Sept. 25.
Grove,	No. 64,	No. 68,	Sept. 15.
Hancock,	Washington ave.,	Franklin,	Aug. 13.
Highland,	No. 83,	No. 91,	Sept. 21.
Warren ave.,	Franklin,	82 feet easterly,	Sept. 25.
Washington ave	Lash,	Hancock,	Aug. 13.

LINES AND GRADES.—SEWERS, 1888.

STREET.	FROM.	TO.	NO. OF POINTS.	DATE.
Broadway,	End of old sewer,	Northerly 105 feet,	7	Sept. 27.
Carroll,	Marginal,	Easterly 215 feet,	10	Sept. 8.
Cary ave.,	Outlet,			March 10.
Crescent av.,	Broadway,	Westerly 93 feet,	3	July 20.
Fourth,	Everett ave.,	Northerly 183 feet,	7	Oct. 1.
Hooper,	End of old sewer,	Easterly 60 feet,	4	Aug. 30.
Parker,	Crescent ave.,	Westerly 258 feet,	11	April 14.
Reynolds av.	Washington ave.,	Westerly 189 feet,	9	Sept. 24.

REPORT OF THE CITY ENGINEER.

PLANS MADE IN 1888.

STREET.	FROM.	TO.	DESCRIPTION.
Broadway,	Southerly side Catholic c'ch,	Northerly side Gerrish' avenue,	Sewer profile and assessment.
Carroll,	Marginal,	217 ft. so. easterly,	Sewer " " "
Cary ave.,	Sewer outlet,		Profile, outlet location Ys.
" "	" "		Tide gate.
Cheever,	Wash. ave.,	Southerly,	Cross section.
Crescent ave.,	Broadway,	94 feet N. westerly	Line and grade.
Crest ave.,	Clark ave,	Park ave.,	Sewer profile and assessment.
Eastern ave.,	Clinton,	Hooper,	Grade.
" "	Hooper,	Woodlawn ave.,	Line and grade.
Essex,	Shurtleff,	Hawthorn,	Line and grade.
Fourth,	Spruce,	183 ft. N. westerly,	Sewer profile and assessment.
Hancock,	Wash. ave.,	Everett Line,	Grade.
Hooper,	No. 24,	64 feet easterly,	Sewer profile and assessment.
Park ave.,	Crest,	Eleanor,	Grade.
Parker,	Crescent ave.,	Spencer ave.,	Sewer profile and assessment.
Poplar,	Fifth,	Sixth,	Line and grade.
Reynolds,	Wash. ave.,	189 ft. N. westerly,	Sewer profile and assessment.
Spencer ave.,	Woodlawn av.,	Eleanor,	Grade.
West Third,	Arlington,	Spruce	Proposed fill.
Willard,	Eleanor,	Crest ave.,	Grade.

REPORT OF THE CITY ENGINEER.

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STREET LINES AND GRADES FOR 1888.

STREET.	LOCATION.	OWNER.	DATE OF LINE.	DATE OF GRADE.	PURPOSE.
Arlington,	Cor. Second,	I. S. Stebbins es.	Sept. 22,	Sept. 28,	St. line.
Beacon,	Lot 15,	Cath. Gannon,	Aug. 8,		House.
Bellingham,	Nos. 5 & 7,	J. Percival,	Oct. 8,		"
Blossom,	Cor Wash. av.,	J. Gould,	Nov. 7,	Nov. 8,	"
Blossom,	Lot 186,	A. Patterson,	April 10,	April 10,	"
Blossom,	Lot 11,	A. H. Drew,	June 23,	June 23,	"
Broadway,	Lots 30 & 32,	J. Mullen,	March 30,		Greenho'se
"	Cor Eleanor,	S. F. Mahan,	"	Mch. 30,	House.
"	Lot 62,	W. H. Morse,	April 26,		"
"	Lot 52,	B. R. Cobb,	Aug. 30,	Aug. 30,	Stable.
"	No. 715,	Mrs. Delia Brown	Nov. 23,	Nov. 23,	House.
Bloomingleale,	Lot 5,	Mary A. Perkins	Dec. 31,	Dec. 31,	"
Carroll,	Lot 113,	P. H. Buckley,	Oct. 9,	Oct. 11,	"
Cheever,	Cor. Wash. av.	F. W. Atkins,	July 26,	July 26,	Fence.
Clark ave.,	Lot 61,	W. H. Morse,	April 26,		House.
"	Lots 71 & 73,	W. Batchelder,	June 25,		Fence.
"	Lots 75 & 77,	T. Martin,	"		"
Clinton,	Lot H,	Louisa Larcome,	March 22,	Mch. 22,	"
"	Lot M,	John Matthews,	"	"	"
"	No. 10,	Walker Bros.,	Sept. 5,	Sept. 5,	Factory.
Cottage,	Lots 70 & 72,	Dennis Martin,	April 4,	April 4,	Fence.
"	No. 74,	E. M. Buttrick,	Sept. 24,		House.
Crescent ave.,	No. 79,	Hutchins & Macomber,	Nov. 30,	Dec. 3,	Carpenter shop.
Crest ave.,	Cor. Willard,	John T. Norton,	June 12,	June 12,	Fence.
Eastern ave.,	Lots 133 & 134,	S. J. Biggerstaff,	June 27,		House.
"	Lots 87 & 88,	Peter Sullivan,	Oct. 9,	Oct. 11,	Fence.
"	Lot 132,	Kate O'Brien,	Dec. 15,	Dec. 15,	House.
Eden,	No. 21,	C. Schultz,	May 28,	May 28,	Raise hse.
Eleanor,	Cor. Broad'y,	S. F. Mahan,	March 30,	Mch. 30,	House.
"	Cor. Spencer,	John Readon,	April 27,	April 27,	Fence.
Everett ave.,	No. 121,	J. S. Green,	June 20,		"
Forsyth,	Cor. Wash. av.	J. H. Wilkinson,	March 1,	Mch. 1,	Houses.
Franklin ave.,	No. 16,	W. Martin,	May 7,		Wall.
Gerrish ave.,	Lot 11,	E. B. Fox,	Aug. 16,	Aug. 16,	House.
"	Cor. Broad'y,	B. R. Cobb,	Aug. 30,	" 30,	Stable.
Hancock,	No. 42,	C. H. McNeil,	Oct. 9,	Oct. 9,	House.
Hawthorn,	No. 130,	W. H. Marsh,	June 4,		Fence.
Hooper,	No. 27,	Julia Egan,	June 1,	June 1,	"
"	Cor. East. ave.	Peter Sullivan,	Oct. 9,	Oct. 11,	"
"	"	Kate O'Brien,	Dec. 15,	Dec. 15,	House,
John,	Lots 22 & 24,	Bevis Tucker,	Jan. 3,	Jan. 3,	"
Maple,	Cor. W. Third,	Chapman & Soden,	July 23,		Storehouse
Marlboro,	No. 63,	J. M. Campbell,	Nov. 20,	Nov. 20,	House.
Marlboro,	Lot 20,	W. S. Cronk,	Oct. 1,		Fence.
Maverick,	Lot 71,	Asa J. Floyd,	May 10,		Stable.
"	Lot 73,	Jerry Donahoe,	May 10,		"
"	Lot 75,	Jeremiah Lyons,	June 4,	June 4,	Fence.
Orange,	No. 22,	Wm. F. Hixon,	July 5,	July 5,	House.
Parker,	Cor Spenc'r av.	J. J. Emroe,	June 16,	June 16,	"
Pearl,	Hawthorn,	W. H. Marsh,	June 4,		Fence.
Poplar,	R'r 158 Chesn't,	Mrs. T. B. Willis & Mrs. A. Poole	May 11,		St. line.
"	Nos. 196, 198, 198 1/2,	P. Lawrence,	Sept. 6,	Sept. 6,	House.
Second,	Ash to Arl't'n,	I. Stebbins est.,	Sept. 22,	" 28,	St. line.
Spencer ave.,	Lots 38 & 40,	Michael Ford,	April 26,	April 26,	House.
"	No. 61,	John Readon,	April 27,	" 27,	Fence.
"	Lot 43,	John Meehan,	May 21,	May 21,	"
"	Lot 36,	Richard Lufkin,	June 6,	June 6,	House.
"	Cor. Parker,	J. J. Emroe,	June 16,	June 16,	"
"	Lots 66 & 68,	Thos. Appleton,	June 30,	June 30,	"
"	Nos. 101 & 103,	F. O. Littlefield,	July 12,		"
"	Lots 55 & 57,	T. Martin & Bro.	Aug. 23,		Fence.
Spruce,	Nos. 124 & 126,	Thos. Morrison,	June 13,	June 13,	"
"	Cr. Ever'tt av.,	J. S. Green,	June 20,		"

STREET LINES AND GRADES FOR 1888.--(Continued.)

STREET.	LOCATION.	OWNER.	DATE OF LINE.	DATE OF GRADE.	PURPOSE.
Spruce,	Cr. Bl'm'gdale,	Mary A. Perkins	Dec. 31,	Dec. 31,	House.
Vale,	Lot 16,	C. H. Black,	July 17,	July 18,	"
Walnut,	Lot 15,	D. A. O'Brien,	July 24,		"
Wash'n ave.,	Cor. Forsyth,	J. H. Wilkinson,	March 1,	Mch. 1,	Houses.
"	No. 252,	Geo. A. Hall,	Oct. 27,		Raise hse.
"	No. 100,	J. Gould,	Nov. 7,	Nov. 8,	House.
Watts,	Lot 53,	H. B. Lambert,	Oct. 26,	Oct. 26,	"
"	Lots 45 & 50,	S. P. Weld,	Dec. 7,	Dec. 7,	Houses.
W. Third,	Lots 42 & 44,	Chapman & So-	July 23,		Storehouse
Willard,	Lot 8,	Chas. Kibby,	June 12,	June 8,	House.
"	No. 43,	J. T. Norton,	"	June 12,	Fence.
"	Lot 8,	D. Henderson,	Oct. 4,		Wall.
Willow,	Cor. Watts,	H. B. Lambert,	Oct. 26,	Oct. 26,	House.
Woodlawn av.,	Lot 2 (F),	Jas. McCall,	Aug. 17,	Aug 17,	Fence.
"	Cr. Spenc'r av.	T. Martin & Bro.	Aug. 23,		"

REPORT OF THE CITY ENGINEER.

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LIST OF DRAINS, LOCATIONS AND DEPTHS, 1888.

STREET.	No.	Description	STREET.	No.	Description
Addison,	72	Repairs	Cottage,	170	New
"	22	New	Crescent ave.,	42	"
"	87	"	"	23	New house
Arlington,	139	Repairs	Division,	106	New
"	174	"	"	102	"
"	Cobb's stable	New	Eastern ave.,	457	"
"	80	Examination	"	437	New house
"	Cr. Williams	New	"	416 to 424	New
"	52	Repairs	Eleanor,	25	"
"	80	"	Everett ave.,	81	"
"	98	"	"	112	"
Ash,	26	"	"	123	"
"	131	"	Fifth,	42	"
"	rear 36 Waln't	"	"	11	"
Auburn,	76	New	"	13	"
"	71	"	Forsyth,	173	New house
Beacon,	132	New house	"	175	"
"	cor. Chestnut	Repairs	"	177	"
Bloomingtondale,	63	New	Fourth,	150	New
"	59	"	Franklin ave.,	301	"
"	103	"	Franklin st.,	35	"
"	137	"	Gilmore place,	1, 2 & 3	Repairs
Blossom,	17	New house	Grove,	90	New
"	Lot 11	"	"	84	New house
"	77	"	Hancock,	42	"
Broadway,	947 & 949	Repairs	"	52	"
"	778	Greenhouse	"	36	"
"	851	New house	Hawthorn,	137	New
"	288	New	Heard,	19	"
"	103	Repairs	High,	20	"
"	984	New	Highland,	72	Repairs
"	Lot 97	"	Hooper,	27	New
"	Lot 41	New house	Jefferson ave.,	16	"
"	Paroch'l sch.	New	"	38	"
"	828	"	"	53	"
"	743	New house	John,	37	"
"	793	New	"	39	"
"	613	New stable	"	41	"
"	858	Repairs	"	43	"
"	715	New house	Maple,	3	"
Carroll,	7	New	Marginal,	cr. Hawthorn	Repairs
"	45	"	"	Strahan's	"
"	53	"	"	paper factory	"
"	59	New house	"	38 & 40	"
"	49	New	Marlboro,	61	New house
Cary ave.,	20	New house	Matthews,	79	New
Cherry,	124	Repairs	"	35	"
"	60	New	Maverick,	37	"
"	222	Repairs	"	11	"
"	221	New	"	8	"
"	142	"	"	65	New house
Chester ave.,	181	"	Medford,	16	Repairs
"	179	"	Michael place,	"	New
"	127	Repairs	Orange,	22	"
Chestnut,	196	"	"	40	"
Cheever,	"	New house	Pearl,	cr. Hawthorn	Repairs
Clark ave.,	141	New	"	69	New
"	Lot 49	New house	Poplar,	Will'ms sch'l	Repairs
"	120	New	"	20	New
Congress ave.,	252	"	"	6	Repairs
"	234	"	"	18	New
"	222	"	"	17	"
"	224	"	"	74	Repairs
"	226	"	"	196	New house
"	181	"	"	198	"
"	47	"	"	198 1/2	"
"	Lot 56	"	Reynolds ave.,	12	"

LIST OF DRAINS, LOCATIONS AND DEPTHS, 1888.—(Continued.)

STREET.	No.	Description	STREET.	No.	Description
Second,	133	New	Vale,	Lot 26	New
"	98	Repairs	"	Lot 16	New house
"	116	"	Walnut,	221	Repairs
"	cr. Arlington	"	"	cor. Fifth	New
"	81	"	"	36	New house
"	23 to 33	New	"	239	Repairs
"	76	New house	"	10	New
Shawmut,	138	New	Wash'gton av.,	339	Repairs
"	148	"	"	410	New
"	52	Repairs	"	Lot 13	"
Shurtleff,	177	New	"	174	"
"	133	New house	"	166	Repairs
Sixth,	86	New	"	54	New
"	90	"	"	367	Repairs
Spencer ave.,	31	New house	Watts,	48	New
"	99	New	"	19	"
"	103	"	"	69	"
"	Lot 38	"	"	94	New house
"	112	"	"	113	"
"	Lot 30	"	West Third,	42	Repairs
"	52	Repairs	"	9	"
Spruce,	184	"	"	34	New
"	159	"	Williams,	137	"
"	163	"	"	133	"
"	237	"	"	135	"
"	339	New	"	60	Repairs
Stockton,	1	Repairs	Willow,	63	New
Suffolk,	85	"	"	82	"
"	87	"	Willard,	Lot 8	New house
Tudor,	26	"	Woodlawn av.,	184	New
"	28	New			

REPORT OF THE CITY ENGINEER.

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LOCATION OF STREET MONUMENTS.

STREET.	Offset.	LOCATION.	Offset.	DATE OF SETTING.	SURVEY BOOK.
	Feet.		Feet.		Vol. Page.
Arlington,	5	Second,	?	A. Lewis,	9 32
"	5	Fifth,	5	A. Lewis,	12 139
*Bassett,	3	Webster ave.,	3	June 21, '88,	17 52
"	3	Reynolds ave.,	3	July '85,	17 52
"	3	County ave.,	3	June 21, '88,	17 52
Beacon,	5	Winnisimmet,	5	A. Lewis,	9 92
"					10 114
Beech,	3	Spruce,	3	Nov. '87,	17 4
Bellingham,	20	Eastern ave.,	17½	A. Lewis,	14 16
Bellingham, n'ly side,	0	Highland,	25	A. Lewis,	15 113
Blossom,	3	Eden,	3	July 3, '88,	16 144
"	3	Spruce,	3	Nov. '87,	17 4
"	3	Maple,	3	Aug. '84,	17 4
"	3	Cypress,	3	"	17 4
Broadway,	3	Eleanor,	3	Aug. 14, '88,	16 77
"	?	Fifth,	?	A. Lewis,	8 19
"	6.72	Third,	5.04	A. Lewis,	17 34
"		Gerrish ave.,	3	Nov. 2, '88,	17 18
Carroll,	3	Eastern "	3	June 27, '85,	17 18
"	3	Marginal,	3	July 15, '87,	17 18
Central ave.,	3	Highland,	3	Aug. 25, '88,	16 50
"	3	Willow,	3	Aug. 28, '88,	16 50
"	5	Highland,	4.12	"	10 100
"	?	Shurtleff,	?	A. Lewis,	
Chester ave.,	3	Highland,	3	Aug. 24, '88,	16 50
"	3	Willow,	3	" 28, '88,	16 50
Clark ave.,	3	Crest ave.,	3	June 29, '88,	16 146
"	3	At angle,	3	June 30, '88,	16 146
"	3	Woodlawn ave., E'ly,	3	"	16 146
"	3	" " W'ly,	7.77	"	16 146
Clinton,	3	Eastern ave.,	3	June 27, '85,	17 18
"	3	Marginal,	3	July 16, '87,	17 18
*County ave.,	3	Bassett,	3	June 21, '88,	17 52
"	3	At P. C. of curve,		June '88,	17 52
"	3	Malden st. (in Everett)	3	June 22, '88,	17 52
Crescent ave.,	3	Eleanor,	3	Dec. 1, '87,	16 77
Crest ave.,	3	At angle,	3	Nov. '85,	13 140
"	3	548.54 ft w'ly of angle,		"	13 140
"	3	Opp Soldiers' Home,		"	13 140
"	3	Clark ave.,	3	June 29, '88,	16 146
Cypress,	3	Second,	3	July 23, '88,	17 4
"	3	W. Third,	3	July 25, '88,	17 4
"	3	Everett ave.,	3	Nov. '87,	17 4
"	3	Sixth,	3	"	17 4
"	3	Heard,	3	"	17 4
"	3	Blossom,	3	Aug. '84,	17 4
Eastern ave.,	17.5	Bellingham,	20	A. Lewis,	14 16
"	3	Hooper,	3	Aug. 23, '88,	17 18
"	3	Carroll,	3	June 27, '85,	17 18
"	3	Clinton,	3	"	17 18
Eden,	3	Heard,	3	July 5, '88,	16 144
"	3	Orange,	3	July 6, '88,	17 1
"	3	Blossom,	3	July 3, '88,	16 144
Eleanor,	3	Broadway,	3	Aug. 14, '88,	16 77
"	3	Spencer ave.,	3	"	16 77
"	3	Crescent ave.,	3	Dec. 1, '87,	16 77
Everett ave.,	3	Fifth,	3	Nov. '87,	17 4
"	3	Locust,	3	"	17 4
"	3	Cypress,	3	"	17 4
"	3	Maple,	3	Aug. '84,	17 4
Fifth,	5	Arlington,	5	A. Lewis,	12 139
"	?	Walnut,	5	A. Lewis,	2 82
"	?	Broadway,	?	A. Lewis,	
Fifth,	3	Everett ave.,	3	Nov. '87,	17 4
"	3	Maple,	3	Aug. 1, '84,	17 4
"	3	Spruce,	3	Nov. '87,	17 4
Gerrish ave.,	3	Broadway,	3	Nov. 2, '88,	17 34

LOCATION OF STREET MONUMENTS.—(Continued.)

STREET.	Offset.	LOCATION.	Offset.	DATE OF SETTING.	SURVEY BOOK.
	Feet.		Feet.		Vol. Page.
Heard,	3	Eden,	3	July 5, '88,	16 141
"	3	Spruce, E'ly,	3	July 3, '88,	16 141
\$Heard,	3	Cypress,	3	Nov. '87,	17 4
"	3	Spruce, W'ly,	3	July 26, '88,	17 4
Highland,	3	Chester avenue,	3	Aug. 24, '88,	16 50
"	3	Watts,	3	Aug. 25, '88,	16 50
"	3	Central ave.,	3	Aug. 25, '88,	16 50
"	25	Bellingham, n'y side,	0	A. Lewis,	15 113
"	4.12	Central ave.,	5		10 100
"	25	Marginal,	?	A. Lewis,	10 100
Hooper,	3	Eastern ave.,	3	Aug. 23, '88,	17 18
\$Locust,	3	Second,	3	July 24, '88,	17 4
"	3	W. Third,	3	July 25, '88,	17 4
"	3	Everett ave.,	3	Nov. '87,	17 4
*Malden (in Everett),	3	County ave.,	3	June 22, '88,	17 52
"	3	Reynolds ave.,	3	June '88,	17 52
"	3	Webster ave.,	3	June '88,	17 52
*Maple,	3	Second,	3	July 20, '88,	17 4
"	3	W. Third,	3	July 25, '88,	17 4
"	3	Everett ave.,	3	Aug. '84,	17 4
"	3	Fifth,	3	Aug. 1, '84,	17 4
"	3	Blossom,	3	Aug. '84,	17 4
Marginal,	?	Highland,	25	A. Lewis,	10 100
"	3	Clinton,	3	July 16, '87,	17 18
"	3	Carroll,	3	July 15, '87,	17 18
Orange,	3	Eden,	3	July 6, '88,	17 1
"	3	Spruce,	3	July 7, '88,	17 1
*Reynolds ave.,	3	Malden (in Everett),	3	June '88,	17 52
"	3	Bassett,	3	July '85,	17 52
Second,	?	Arlington,	5	A. Lewis,	9 32
\$Second,	3	Spruce,	3	July 19, '88,	17 4
"	3	Maple,	3	July 20, '88,	17 4
"	3	Cypress,	3	July 23, '88,	17 4
"	3	Locust,	3	July 24, '88,	17 4
Second,	4.84	Walnut,	4.88	A. Lewis,	17 9
Shurtleff,	?	Central ave.,	?	A. Lewis,	
Sixth,	3	Cypress,	3	Nov. '87,	17 4
"	3	Spruce,	3	"	17 4
Spencer ave.,	3	Eleanor,	3	Aug. 14, '88,	16 77
"	3	Second,	3	July 19, '88,	17 4
"	3	W. Third,	3	Oct. 29, '87,	17 4
"	3	Fifth,	3	Nov. '87,	17 4
"	3	Beech,	3	"	17 4
"	3	Sixth,	3	"	17 4
"	3	Heard, W'ly,	3	July 26, '88,	17 4
"	3	Blossom,	3	Nov. '87,	17 4
Spruce,	3	Orange,	3	July 7, '88,	17 1
"	3	Heard, E'ly,	3	July 3, '88,	16 144
\$Summit ave.,	0	Warren ave.,	0	Nov. '85,	13 122
"	0	Woodlawn ave.,	0	June '85,	17 15
Third,	5.04	Broadway,	6.72	A. Lewis,	8 19
Walnut,	5	Fifth,	?	A. Lewis,	2 82
"	4.43	Williams,	5	A. Lewis,	17 9
"	4.88	Second,	4.84	A. Lewis,	17 9
\$Warren ave.,	0	Summit ave.	0	Nov. '85,	13 122
Watts,	3	Highland,	3	Aug. 25, '88,	16 50
"	3	Willow,	3	Aug. 28, '88,	16 50
*Webster ave.,	3	Malden (in Everett),	3	June '88,	17 52
"	3	On County Line,		"	17 52
"	3	Bassett,	3	June 21, '88,	17 52
\$West Third.	3	Spruce,	3	Oct. 29, '87,	17 4
"	3	Maple,	3	July 25, '88,	17 4
"	3	Cypress,	3	"	17 4
"	3	Locust,	3	"	17 4
Williams,	5	Walnut,	4.43	A. Lewis,	17 9
"	?	Winnisimmet,	5	A. Lewis,	10 114
Willow,	3	Chester ave.,	3	Aug. 28, '88,	16 50

LOCATION OF STREET MONUMENTS.—(Continued.)

STREET.	Offset.	LOCATION.	Offset.	DATE OF SETTING.	SURVEY BOOK.
	Feet.		Feet.		Vol. Page.
Willow,	3	Watts,	3	Aug. 28, '88,	16 50
"	3	Central ave.,	3	" "	16 50
Winnisimmet,	5	Beacon,	5	A. Lewis,	9 92
"	5	Williams,	?	A. Lewis,	10 114
Woodlawn ave.,	0	Summit ave.,	0	June '85,	17 15
" " E'y,	3	Clark ave.,	3	June 30, '88,	16 146
" " W'y,	7.77	"	3	" "	16 146

*These monuments were set by Joseph R. Carr to locate the streets as laid out by him, for F. W. Reynolds.

§These monuments were set to locate the streets as located by Wm. E. McClintock, City Engineer, and Joseph R. Carr, Civil Engineer.

HIGHWAYS.

The general scheme of work during the past year was the same as for previous years.

The effort was made to put in as much permanent work as the appropriation would allow, even to the neglect of some of the less travelled streets, believing that by this policy the money will be expended to better advantage, and the results in a few years, far more appreciated than would be the case if nothing but patchwork was done.

Following out this plan, the gutters were paved on certain streets where there were edgestones placed and the storm water tended to wash so badly as to cause the edgestones to pitch out unless such precaution was taken.

Chestnut street, Williams street, Second street, Spencer avenue, Broadway from the railroad to Cary avenue, and the extension of Essex street, laid out last year were thoroughly covered with broken stone and rolled with the steam roller making as good streets as can be found anywhere. The end of Broadway near the Revere town line was also served in the same manner after raising some 18 inches across the old bridge.

Congress avenue, Winthrop street, Cottage street, Franklin street, and part of Spruce street where the grade is heavy and the surface badly wash with every rain, were covered with a coating of hard-pan and this in turn coated with gravel. The re-

sult was a good summer street but one that muds up badly on the surface in wet weather. I propose to cover these in the spring with two inches of clear gravel allowing it to work in with the hard-pan and by such treatment make a surface that will not wash and at the same time not be muddy.

The section of Spencer avenue between Parker street and Eleanor street, was finished by teaming on 4528 loads of dirt and gravel and it now stands at the legal grade.

Work was begun on the section of the same street between Eleanor street and Woodlawn avenue, with the idea of making a through street for light travel off of Broadway, but owing to the appropriation giving out this was dropped. The street at present time is in rather a bad condition and should be attended to as soon as the weather admits.

Sixth street was brought up to a good grade, as near the final grade as it ever will be probably.

Parker and Eleanor streets were partly brought up with Spencer avenue but more work will have to be done to make them safe and convenient.

A sidewalk was built on the lower side of the old bridge on Broadway at the Revere town line, eight feet wide and the outer side resting on a row of piles driven into the bed of the mud, properly capped and covered. This does away with what has for years been a very dangerous spot.

We have endeavored to make all the streets safe to public travel by filling up all the bad places.

We have been constantly at work with a team and man mending brick and gravel sidewalks. This is a work that was much needed and should be continued year by year until such time that all the walks of the city are not only safe but comfortable for pedestrians.

A glance at the expense account submitted will show that the work of sweeping the paved streets is one that costs quite a goodly sum when compared with the total amount at our disposal, but it is a work that perhaps affords as much satisfaction to the general public as any work we do.

As the number of macadamized streets increase this amount will be increased by the amount needed to keep them clean.

This is not only a work of comfort but one that must be carried out in order to preserve the surface from destruction. If the fine dust be allowed to remain on the surface of the broken stone streets it holds the rain as a sponge and softens the lower stone so as to start them and then hollows form and the street is poor.

The steam road roller has done some excellent work. The results far exceed my most sanguine expectations. Its great weight compacts the whole mass of stones and presses it down to a firm bed and so solid is it that no depression has shown itself in any street where the roller has worked. The work can be done cheaper, faster and better than by the old horse roller. With the old roller we could not find time to roll more than about a quarter of our work and this in an indifferent manner but with the steam roller we can and do roll all of the streets we cover.

The crusher set up last year has worked splendidly, and the quality of road metal we now obtain cannot be beat anywhere.

As to price I think we can compare with anybody. The table submitted shows this, and an examination of it will show that as compared with our outfit at the "hill" that was in use for years before the present arrangement was made, we now break for about 75 cents per ton cheaper than we did then.

The only sure way of progressing in this direction is to put in a certain amount each year for macadamizing and in a few years we shall be proud to speak of our streets as a little better than others.

I wish to call especial attention to Second and Marginal streets. The travel over these two streets is very heavy and the streets very bad. Second street being a through street should be put in first-class condition at once. Marginal street will speak for itself if a committee will but look at it after a storm.

There are other streets that need a thorough repairing with broken stone, such as Williams from Winnisimmet to Broadway; Hawthorn from Park to Bellingham; Fourth from Pearl to Arlington; Third from Broadway to Chestnut; Fifth from Broadway to Arlington; Central avenue from Shurtleff to Willow, and in fact from Willow to Eastern avenue; Congress avenue; below

Willow; Highland street; Chester avenue from Highland to Willow; Cary avenue; Orange street; Bloomingdale street; Addison street; Blossom street; Eden street; and others that could be easily named.

Work was begun on Woodlawn avenue with the idea of making a fine street for driving. Good progress has been made but still a great deal of work must be done before any practical results will be seen.

The work of building sidewalks of brick is now progressing so rapidly that in a few years we shall have paved walks on all sides. In order to make permanent work in this direction the gutters should be paved wherever edgestones are placed. Gutters paved in this way serve to hold up the edgestone, preserve the shape of the street by preventing the unsightly washing of the gutters, and save a large annual expense in cleaning out catchbasins and sewers that fill with the washing of the gutters.

Early in the year Mr. Wm. S. Bassett who has been connected with the department for twenty-two years was on account of ill health obliged to resign his position. Mr. Bassett's good nature made him a friend of all and his loss has been greatly felt.

PAVED GUTTERS, 1888.

	Square yards.	Tons Stone.	Cost.
Central avenue, Shurtleff to Shawmut,	166.83	48	\$134.99
Shurtleff, Central, southerly,	32.33	9	25.65
Congress avenue, Shawmut, easterly,	80.96	23	65.01
Fifth, Walnut to Ash,	45.60	13	36.69
Marlboro, Shurtleff, easterly,	213.60	63	175.45
Highland, Central, past No. 91,	28.18	8	32.72
Grove, No. 64 past No. 68,	37.07	11	41.16
Crescent avenue, Washington, Tudor,	101.80	30	106.73
Essex, Hawthorn to Shurtleff,	189.07	56	206.37
Broadway, Gerrish avenue,	12.12	2	8.88
Round stone not used and teaming,		46	94.68
	907.56		\$928.33

REPORT OF THE CITY ENGINEER.

17

PAVED GUTTERS, REPAIRS.

Walnut street	\$ 99
Washington avenue	1 53
Broadway Square, 9 tons of stone and re- pairs of Poplar and Marginal streets	77 48
General repairs of paved streets	318 50
Loading and screening 76 loads	22 04
	\$420 54

PAVING.

Revere line	\$169 03
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REPAIRS OF BRICK SIDEWALKS, 1888.

STREET.	SIDE.	FROM.	TO.	Sq. Yds	bricks	ft. e. s. reset.	COST.
Williams, Congress ave., Suffolk, Marlboro, Fifth, Shurtleff, Shurtleff, Central, In general	N.E'y N.E'y S'th Both S'y E'y E'y Both	Walnut, Shawmut, No. 43, Shurtleff, Walnut, Central, Marlboro, Shurtleff,	Ash, Easterly, No. 61, e'd b'ck bl'ck Ash, S'y 10 ft., Southerly, Shawmut,	137.88 225.58 123.60 472.28 132.67 60.08 16.33 520.86	1856 2510 1465 2390 138.90 2130 2000	128.4 235.1 167.3 613.55 138.90 89.50 519.20	\$40 17 66 83 44 68 147 75 46 81 27 32 7 36 176 85 50 93
				1,689.28	12,461	1,901.95	\$608 70

SUNDRY SMALL REPAIRS OF BRICK SIDEWALKS.

Washington avenue	\$1 00
Broadway	3 25
Medford	3 25
Unitarian alley	6 75
Congress avenue, No. 7	2 04
Arlington street	2 29
Walnut street	9 81
Fourth street	4 78
Central avenue	76
Poplar street	11 43
Lynn street	2 19
Pine street	4 57
Hawthorn street	6 37
Essex street	16 12
Loading and screening 154 loads gravel	44 66
Division street	1 53
	\$120 80

GRAVEL SIDEWALKS, REPAIRS 1888.

General small repairs,	82 loads,	\$48 25
Second street,	40 "	15 71
Heard street,	45 "	24 82
Fourth street,	26 "	11 45
Parker street,	137 "	74 22
Matthews street,		76
Spencer avenue,	70 "	39 68
Central avenue,	14 "	8 10
Division street,	3 "	1 53
Congress avenue,	5 "	4 57
Broadway,	29 "	12 03
Spruce street,	8 "	3 81
Washington avenue,	25 "	15 96
Addison street,		1 53
West Third street,	14 "	8 10
Chester avenue,	5 "	3 92
Grove street,	18 "	6 10
Maverick street,	8 "	3 05
Blossom street,	32 "	40 30
Eleanor street,	36 "	6 53
Hawthorn street,	6 "	3 05
Ash street,	10 "	5 05
Franklin avenue,	7 "	4 58
China street,	2 "	77
Williams street,	45 "	17 84
Shurtleff street,	16 "	5 33
Crescent avenue,	142 "	90 39
Garland street,	2 "	1 52
Winthrop street,	13 "	8 10
Tudor street,	17 "	15 20
Beach street,	2 "	1 52
Sixth street,	17 "	9 85
Loading and screening	876 "	254 04
		\$747 69

STREET REPAIRS, 1888.

Walnut street,	4 loads gravel,			\$1 52			
Eastern ave., fence,				101 40			
General repairs,	255	"	"	39 loads stone,	289 44		
Clark avenue,	15	"	"		10 67		
West Third street,	25	"	"		44 94		
Fourth street,	35	"	"	4	"	"	22 17
Cary avenue,				37	"	"	16 21
Winnisimmet street,				3	"	"	1 53
Poplar street,				7	"	"	3 05
Marginal street,				76	"	"	12 68
Cottage street,	222 loads gravel,	22	"	"			272 14
Everett avenue,	74	"	"	3	"	"	78 20
Shawmut street,	48	"	"				23 88
Fifth street,	8	"	"	4	"	"	17 17
Spruce street,	219	"	"				117 05
Central avenue,	45	"	"				47 94
Matthews street,				6	"	"	5 83
Addison street,				3	"	"	2 53
Eden street				45	"	"	26 76
Maverick street,				12	"	"	8 10
Carmel street,							1 75
Vale street,				4	"	"	8 52
Marlboro street,	241 loads gravel,	3	"	"			178 03
Hancock street,							1 00
Tudor street,	2	"	"				1 52
Grove street,	248	"	"				129 52
Hawthorn street,	11	"	"	5 loads stone,			9 62
Pearl street,	8	"	"	14	"	"	9 17
Shurtleff street,	12	"	"				7 10
Chester avenue,				3	"	"	1 52
Highland street,				166	"	"	54 88
Orange street,				4	"	"	3 05
Division street,				10	"	"	4 57
Hooper street,							11 38
Loading and screening	4528 loads gravel,						1,316 64
Spencer avenue, grading,	2656	"	"				722 80
"	"	Eleanor to Vernon,	268 loads gravel,				258 17

Warren avenue, 6 loads gravel,	5	50
Crescent avenue, 27 " "	75	65
Broadway bridge at Revere line sidewalk,	160	00
" Cary avenue to Revere line, 674 gravel,	662	22
Parker street, grading, 268 loads gravel,	154	50
Sixth street, " 625 " "	273	73
Congress avenue, 120 loads gravel, 211 loads stone,	334	20
Franklin avenue, 462 " " 18 " "	260	89
Lynn street, 3 " " "	1	53
Winthrop street, 119 " " 4 " "	79	50
Library street, 44 " "	19	78
Bloomingdale street,	5	05
Lafayette avenue, 188 " " 111 " "	70	55
Cherry street, 3 " " "	1	52
Eleanor street, 276 " " "	42	98
Willard street, 3 " " 3 " "	2	52
Medford street, 3 " " 7 " "	4	57
Gerrish avenue, 239 " " "	63	45
Eustis street, 10 " " "	4	58
Poplar street, 7 " " "	3	05
Auburn street, 101 " " "	40	55
	\$6,088 93	

NEW CROSSINGS 1888.

Eden at Heard street 10.7 sq. yds. old stone,	\$7	01
George at Tudor street 11.7 sq. yds.,	65	24
Clark avenue at Parker street old stone,	6	57
Broadway and Eleanor street 27.6 sq. yds. old stone,	10	21
Spencer avenue at Woodlawn avenue 15.05 sq. yds.,	58	64
Lawrence at Clark avenue 10.8 sq. yds.,	57	47
Washington avenue at Hancock street 2 sq. yds.,	55	77
Essex at Shurtleff street 13.83 sq. yds. old stone,	5	11
Essex at Hawthorn street 14.18 sq. yds.,	5	25
	\$271 27	

CROSSING REPAIRS, 1888.

Loading gravel,	\$6 09
Spencer avenue at Eleanor street two relaid,	17 75
Broadway at Library street relaid east half,	11 65
Matthews street at Broadway relaid and raised,	12 72
Second street at Broadway raised,	12 14
Franklin avenue at Winthrop street raised,	19 18
Williams street at Chestnut street,	7 73
Walnut street at Everett avenue,	5 14
Chestnut street at First Church, raised,	7 52
Williams street at Winnisimmet street,	3 00
	\$102 92

MISCELLANEOUS, 1888.

Cleaning snow from sidewalks and sanding,	\$416 20
" " " streets,	249 97
" " and ice from gutters,	628 81
Sweeping paved streets,	1,309 54
Cleaning crossings,	639 51
Trimming trees,	155 40
City Stable house water,	7 00
Cleaning gutters, 1270 loads,	970 49
City Stable, general repairs about building and yard,	93 57
" " underpinning old stable,	83 85
" " cleaning yard and cellar,	51 38
" " building tool room,	112 17
" " fence,	88
" " repairs stalls and stable,	19 42
" " cleaning harnesses, &c.,	7 00
" " extending cart shed,	235 06
Sharpening picks bars, &c.,	74 50
New tools,	45 80
Steam roller, repairs and care,	123 49
" oil and waste,	42 12
" coke and fuel,	79 00
" tools,	16 55
Telephone,	84 05

Foreman and inspection,	1,417 29
Piling bricks in yard,	1 00
Loading stock at yard,	24 49
Men holidays and rainy days not at work,	434 25
Expense of committee,	32 75
Printing time sheets and gravel tickets,	13 30
Setting street signs and lettering,	23 70
Gravel bank lumber,	5 57
Gravel bank sand screen,	8 35
Oil and wicks and lanterns,	16 35
Cleaning vault at stable,	5 00
Cask of nails,	3 00
Teaming sand, gravel and stone to city yard,	73 97
Setting stone street bounds,	81 80
	\$7,586 38

CRUSHING STONE.

Cost of crushing for the year, including every item at and around the crusher, engine and bins, and stone, quarrying, breaking to go into crusher, teaming to crusher, &c.

The price is given per ton of stone broken for each item.

Running,	\$0 051	
Repairs and putting in pump,	0 055	
Feeding,	0 078	
Stone, quarrying &c.,	0 967	
Clearing screen and bins,	0 025	
Fuel,	0 048	
Oil and waste,	0 007	
Chills,	0 020	
Water,	0 005	
Total cost per ton,	\$1 256	
Total amount expended crushing,		\$4,847 14
Loading and teaming to small repairs,		408 56
		\$5,255 70

7. 11th St. Sup't at Quarry

1.25 / per ton

50 for F.R. to Cambridge

1.75

MACADAMIZING STREETS, 1888.

	Length.	sq. yds.	lds.gr.	lds.st.	Cost.
Williams, Broadway to Walnut,	570	1900	56	241	\$218 81
Second, Poplar to Ash,	450	1500		139	135 72
Wash'gton av. R.R. to Mill's cor.,			110	556	687 21
Chestnut, Williams to Fourth,	1600	5330		440	473 35
Spencer av., Parker to Eleanor,	550	1830	33	366	362 31
*Woodlawn ave. Howard st. to Webster ave.,			116	726	617 03
Broadway, R.R. to Cary ave.,	530	824		82	92 87
Essex st., Shurtleff to Hawthorn,	270	720		370	273 04
					\$2,860 34

The above cost includes teaming the stone, levelling, rolling, but not the cost of the stone and breaking.

SUMMARY OF HIGHWAYS 1888.

Paving gutters	\$928 33
“ “ repairs	420 54
“ streets, repairs	169 03
Brick sidewalk repairs	729 50
Gravel sidewalks repairs	747 69
Crushing stone, &c.,	5,255 70
Macadamizing	2,860 34
Street repairs	6,088 93
New crossings	271 27
Repairs crossings	102 92
Miscellaneous	7,586 38
	\$25,157 13

Work for department and others.

Sewer	794 30
Edgestone	223 10
Water	237 95
Public property	202 24
Other parties	25 15
Total paid out of highway account	\$26,643 37

*No broken stone was used on this street. The stone used were screenings from the gravel bank.

Total paid out of highway account	\$26,643 37
Appropriation and receipts,	27,458 45
Balance	<u>\$815 08</u>
Outstanding bills	\$148 72
Difference on keeping horses	126 29
	<u>275 01</u>
Balance in highways account	\$540 07

STATEMENT SHOWING THE ITEMS OF THE RECEIPTS, HIGHWAYS 1888.

Appropriation	\$25,000 00
Transfer	430 00
Sale of articles	329 11
Rent of stable house	78 00
Edgestone department for work done	794 30
Water " " "	432 95
Sewer " " "	223 10
Public property	170 99
Bills of 1887 paid	<u>113 10</u>
	\$27,571 55

The item of old bills paid was placed to credit of this department last year and so does not show in the amount of receipts, and the amount of receipts will therefore be \$27,458.45 as shown in the previous statement.

EDGESTONES.

The work of paving sidewalks in connection with edgestones set, begun in 1881 has steadily progressed until at the present time we have 4.33 miles of brick walk laid under the law.

The appropriation is not sufficiently large to allow of paving much more than one-half the walks petitioned for.

The table shows what has been done during the year, and the second table shows what has been done since 1880:

NEW SIDEWALKS BUILT IN 1888.

STREET.	SIDE.	FROM.	TO.	CORNERS.		No. of Bricks.	Ft. Edgestones		Square Yards.	Length.	Cost.	Assessed	Paid in 1888.
				OLD.	NEW.		OLD.	NEW.					
Bloomingtondale, Broadway,		No. 63, Nos. 475 & 477,				1,229 1,856	25.8 28.0		24.71 37.12	27.8 28.0	\$40 74 64 51	\$21 35 31 33	\$21 35 31 33
Broadway,	E'y	No. 583,	Railroad bridge,		2 4	18,141		374.05	405.13	395.25	759 74	382 41	242 10
B'dy & Eleanor	E. & N.	Corner,	Both ways,	3 1		9,080	64.55	101.8	180.59	159.85	277 94	138 96	138 96
B'dy & Eleanor	E. & S.	Corner,	Both ways,	3 1		9,048 3,374	65.10 50.60	97.2	180.95 67.47	156.10 50.60	278 59 99 17	139 29 49 58	139 29 0 00
Ches't & Sec'd Clark ave.,	W. & S.	Corner, No. 23,	Both ways,	3 1		10,335 6,131	198.30 90.70		210.80 85.54	194.80 90.70	327 07 170 18	161 13 92 90	17 38 92 90
Crescent ave.,	N'y	Wash'n ave.,	Tudor,	2 3		12,440	33.20	199.0	248.81	233.00	416 67	208 33	89 26
Essex, Franklin ave., Franklin av. & Warren av., Grove,	Both	Shurtleff, No. 16, Corner, No. 64,	Hawthorn, Both ways, E'y line 68,	2 3 2		21,859 3,904 8,023	100.00 61.40	447.3	471.28 78.10	515.30 61.40	856 90 106 51	196 48 59 23	196 48 59 23
Grove,	S'y	Broadway,	Shurtleff,	3 2		3,952		91.20	79.04	90.80	138 02	65 69	44 99
Hancock, Highland, Tremont, Walnut, Wash'n ave., " "	S'y E'y	Wash'n ave., No. 83, No. 20, No. 36, No. 238, No. 239, No. 284,	Franklin street, Past No. 91,	3 1		3,220 11,717 4,170 1,370 3,044 3,830 3,650 7,724	76.0		64.43	76.3	50 79	0 00	0 00
Wash'n ave., Wash. ave. & Forsyth,	W'y N & W	Lash, Corner,	Hancock, Both ways,	3 1		6,372 By J.H.W.		132.00	127.44	119 0	210 82 42 00	105 41 0 00	74 89 0 00
Stock bought and on hand, and labor performed before 1888,						154,469	1,258.25	1,986.40	3,113.13	3,024.50	\$5,250 09 369 01	\$2,366 32	\$1,496 20
Total outlay in 1888,											\$4,881 .08		

EXPENDED IN EDGESTONE ACCOUNT 1888.

New sidewalks as per schedule \$4,881 08

Small Repairs.

Arlington street 38 17
 Eleanor street 4 25
 George street : 92
 Eden at Addison street 2 68

Miscellaneous.

Expense of committee 5 75
 Teaming stone to city yard 3 57
 Edgestone not used 127 64
 Wharfage on stone not used 3 29
 Freight on brick 14 40
 Four casks cement 5 60
 Repairing tools 75
 Raising street bounds 2 00
 26,031 bricks used in repairs, charge in highway 286 34

Total \$5,376 44

Table showing length of sidewalk, feet of new edgestone placed, the number of feet of edgestone set, and the number of square yards of sidewalk paved during the years from 1880 to and including 1888.

Year.	Length.	ft. E. S. new.	ft. E. S. set.	Sq. yds. paved.
1880		3,377.0	5,077.3	
1881	1,530.3	2,090.4	2,779.4	1,131.72
1882		2,645.4	4,175.4	
1883	2,626.0	1,993.3	5,102.7	2,588.49
1884	3,404.4	2,914.5	5,305.9	2,831.88
1885	3,265.3	2,323.7	3,818.0	3,003.97
1886	5,209.7	2,920.1	4,493.0	4,873.42
1887	6,813.8	3,470.9	5,816.8	7,246.71
	22,849.5	21,735.3	36,568.5	21,676.19
	4.33 miles	4.12 miles	6.93 miles	

SEWERS.

The usual routine work has been done during the past year. Six short extensions have been built. The Parker street sewer to which I called attention in my last report was rebuilt in a thorough manner, on a pile foundation and is now all right.

The main work of the year in this department was the building of a sewer, connecting with the sewer in Crescent avenue at Parker street and extending through Crescent avenue, Eleanor street and Willoughby street across Eastern avenue. The end being in a tide-gate chamber 60 feet east of Eastern avenue. From this point there is an open ditch to low water mark.

In my report and estimate of 1887 I planned on outleting at high water mark with a ditch from there to low water.

The committee on-looking over the matter and knowing that there was being made at that time a thorough study of the whole Mystic valley for one sewer, which would probably include this section deemed it good policy to not construct the sewer beyond Eastern avenue at present or until the report of the State Board of Health should reveal what their proposition was.

The result was that \$20,000 was appropriated in 1887 to build a part of the sewer.

Early in 1888 the whole subject was discussed by the committee and a contract entered into with Mr. Thos. Ruggles, of this city, to drive the piles and put in the timber foundation. Mr. Ruggles completed his part of the work in a thoroughly workmanlike manner.

It was decided by the committee to do the excavating by the day and accordingly John McCarthy, of this city, was employed as foreman for the labor part. This part of the work proved to be much more difficult than we had planned on as the trench was all in soft mud that had to be sheeted the whole way. The pressure on the sheeting was in places sufficiently great to break spruce timbers 6 inches by 10 inches like a pipe stem. The greatest care was needed on the whole of the excavation and Mr. McCarthy performed his part of the work in a way that was satisfactory to both the engineer and the committee.

It was early felt by the engineer and the committee that owing to a rise in material as well as labor since the estimate was made on the previous year that the amount available was rather small. It was therefore decided to do all the rest of the work except the sidewalks by the day and purchase all materials at the best prices possible.

Mr. John Ford was engaged as foreman of the masonry. The side walls, of stone were contracted out to Mr. Bevis Tucker of Chelsea.

Both of these works progressed without serious difficulties and the whole work was completed and in working order by the middle of July. It was my intention originally to put in a storm overflow, but owing to the objections to such things in the popular mind, we decided not to build it. Unfortunately, in less than one week from the time the connection was made with the old sewer at Parker street, at a time when the cement was still green and when but six inches of dirt covered the top of the arch, we had a very heavy rainfall, on the top of the tide, and the water rose about four or five feet above the top of the arch. The tide-gate held the water in, and as a result, a break was made in the sewer, tearing out one side of the arch for about 25 feet, but not disturbing the walls, invert or foundation.

This was repaired and a storm overflow build in, six feet long by two feet wide, that would act when the water rose in the sewer to within six inches of the crown. No further trouble has been had with it.

By the completion of this sewer, we have an outlet for all our sewers to tide water. The sewer was built as well as it could be, of the best materials, and by the best workmen we could employ.

The foundation is a row of piles under each side, capped by a six by ten inch spruce stick. On this cap is laid a floor of six-inch spruce. The side walls, to the top of the invert, are of rubble stone laid in cement mortar. A concrete bed is laid on the flooring shaped like the invert and rammed in place. On this is laid the invert, one course of bricks on edge and carried up to the springing of the arch, being thickened out to 16 inches at the top of side walls. Then the centres were put in place,

and the arch covering built, of two rings of brick. Five man-holes were built at different points. Branches or slants were built through the side walls, on each side, each twenty-five feet. All the inside brick work was laid strictly to a line, and thoroughly cleaned.

The labor part of this, to us great work, was all performed by residents of Chelsea. The only two contracts let, were to Chelsea men. The timber was purchased of T. H. Buck & Co. The stone came from County avenue. The brick came from O. S. Foster's Cary yard. The cement and pipe were purchased of S. S. Tukey and Geo. T. Oakes. The shovels and other tools were bought of Tukey. The cost of repairing the break and putting in the storm overflow was \$130.65.

The State Board of Health have reported on the "metropolitan" sewer. By its report the assessment on Chelsea will amount to about \$400,000 or \$500,000, and the annual cost for maintenance will be from \$20,000 to \$25,000. These figures are so very large, and the benefit so small that the only course remaining for Chelsea to pursue, is to oppose the whole scheme as far as it relates to her, from the very beginning. The scheme presented is doubtless a good one in every respect as far as performing the duty called of it, but we don't need it, and do not want to pay for it.

If this is the decision then it remains to carry out my original idea and extend the present sewer to high water. This can be of pile and timber and can be done for about \$3,000. I most respectfully recommend that this work be done the present year. Why I am so urgent, is that the ditch is in soft mud and the constant tendency is to cave and fill in. It was sheeted by using the old plank used in the main trench but this being only intended for temporary use, will not stand the pressure of the banks and will gradually cave in, tending to injure the usefulness of the sewer, and free working of the tide gate.

NEW SEWERS BUILT IN 1888.

STREET.	FROM.	TO.	LENGTH in inches.	SIZE.	Material.	Cost.
Crescent ave.,	Broadway,	Littlefield's	93.0	6	Ak. pipe.	\$70 13
Hooper,	End of sewer,	Easterly,	60.2	10	" "	145 87
Carroll,	Marginal,	"	214.6	10	" "	308 96
Reynolds ave.,	Washington ave.,	Westerly,	189.2	10	" "	203 26
Fourth,	Everett ave.,	"	183.3	12	" "	194 21
Broadway,	Cath. Ch. Crossing,	Railroad,	105.0	10	" "	171 41
Parker,	Crescent ave.,	Spencer av	257.6	18	" "	755 83
			1,102.9			\$1,849.67

CLEANING SEWERS, 1888.

Suffolk street	\$49 25
Addison street	18 00
Broadway	1 50
Cary avenue	165 92
Prattville sewers	13 00
Chester avenue	7 75
Summer street	7 00
Spruce street	4 00
Marginal street	3 50
Water for flushing	100 00
Prattville tank cleaning	100 00
	\$469 92

NEW MANHOLES 1888.

Second between Spruce and Arlington streets (two)	80 23
Marginal and Suffolk streets	41 50
Suffolk and Charles streets	36 05
	\$157 78

SEWER REPAIRS, 1888.

Chester avenue	\$48 50
Second street,	29 12
Walnut street	4 00
Cary avenue	130 65
Cypress street	1 75

TOOLS.

8 foot locker,	6 gravel rakes,
40 short handle square shovels,	2 tool boxes,
21 snow shovels,	2 crowbars,
35 long handle round shovels,	1 crosscut saw,
8 " " square "	3 wheelbarrows,
25 hoes,	10 street horses,
35 picks,	7 screens,
1 rammer,	2 sledge hammers,
1 wooden tamp,	1 hand saw,
2 narrow axes,	2 wood saws,
19 chains,	2 mauls,
1 oil can,	1 vice,
1 rasp,	1 draw shave,
1 spoke shave,	1 chisel,
50 feet hand hose,	1 screw driver,
1 grindstone,	1 bit stock,
30 lanterns,	1 hammer,
3 stable brooms,	1 paving hammer,
3 brooms,	6 stable buckets.

PAVING MATERIAL.

272 feet edgestones,	1 2-foot corner,
3 cesspool curbs,	Lot round stone,
1 8-foot cesspool corner,	2 street monuments.

Respectfully submitted,

W. E. McCLINTOCK,

City Engineer.

Length of sewer, 1,465.2 feet. Diameter of arch, 6 feet, two rings thick. Diameter of invert, 5 feet, with centre in crown, one brick on edge.

SCHEDULE OF CITY PROPERTY.

SEWER DEPARTMENT.

18 inch pipe, 30 feet,
15 " 24 "
12 " 6 "
10 " 40 "
8 " 8 "
6 " 30 "
18 inch cement pipe, 21 feet,
12x6 Y's 2 feet lengths, 1 piece,
10x6 " 2 " 1 "
8x6 " 2 " 3 "
One 12 inch slant.
One 10 " "
Five 18 " rings,
Eight 15 inch rings,
Four cesspool curbs, granite,
Manhole, curb and covers,
Flush-tank casting, one set,

Square cesspool cover, 24-in. 3,
" " " 20-in. 2,
" " " 19-in. 3,
Cesspool grates, 24-inch, 3,
" tubs, 3,
Sewer bucket, 15-inch, iron,
" " 6 " "
200 feet rope,
300 " cleaning rods,
Mortar bins, 4,
One pair hip rubber boots,
One oil suit,
Cesspool winch,
Iron rammers, 5,
Pails, 10,
Spirit level,
Flush-tank, curb and cover.

HIGHWAY DEPARTMENT.

1 extra set reins,
7 team horses,
1 driving horse,
2 buggy harnesses,
1 wagon "
9 cart "
5 chain "
2 double "
9 blankets,
9 halters,
1 democrat wagon,
1 concord "
2 sleighs,
1 jigger,
9 dump carts,
4 single sleds,
2 large snow sleds,
5 snow plows, Bacon's,
3 old snow plows,
1 street sweeper,
1 wheeled scraper,
1 two ton roller,
1 pump,

1 Rawson and Hittinger stone,
crusher (condemned),
1 Farrell & Marsden stone
crusher,
1 hay cutter,
100 bundle broom stock,
9 tons hay,
3 hay forks,
1 coal stove,
5 cat wrenches,
1 monkey wrench,
Tackle and falls,
2 double blocks,
Platform scales,
1 iron kettle,
1 bucket wheel grease,
2 horse weights,
14 bundle straw,
1 fur robe,
1 lot old flagging,
1 Avelling & Porter steam road
roller and equipments,
2000 face bricks.

Arch, labor,	\$388 22	
" masons,	462 00	
" 237,393 bricks,	2,136 54	
" 396 bbls. cement,	567 80	
" 142 loads sand,	58 24	
" scraping arch,	48 00	
		3,634 55
Five manholes, labor,	\$29 00	
" mason,	20 11	
" 7,500 bricks,	60 50	
" 6 1-2 bbls. cement,	8 30	
" 4 loads sand,	1 68	
" granite skewbacks,	35 00	
" curbs and covers,	61 25	
		215 84
Gate chamber, labor,	23 80	
" masons,	22 30	
" 7 bbls. cement,	9 80	
" 4,006 bricks,	40 05	
" 4 loads sand,	31 68	
" gates,	135 00	
" granite covering,	44 20	
		284 33
Inspection,		156 50
Skewback Eastern avenue,		6 00
Water for masonry,		26 25
Advertising,		10 75
Telephone,		119 40
Tools,		118 90
Slants and pipe,		76 07
Foreman of labor,		528 75
Foreman of masons,		399 00
Ballast at railroad,		24 50
Cleaning up,		243 85
Water boy,		41 00
Sundry small expenses,		258 53
		\$22,163 10

Printing	8 65
Incidental small works and unused stock	61 67
Cleaning out catchbasins and manholes	891 75
	\$1,496 58

SUMMARY OF SEWERS, 1888.

New sewers as per schedule	\$1,849 67
Cleaning sewers	469 92
Repairs of sewers	355 11
Culverts	10 00
New manholes	157 78
New catchbasins	73 50
Catchbasin repairs	222 11
Drains to vacant lots	6 00
"Y" branches in place of straight pipe	37 38
Miscellaneous	1,496 58
	\$4,678 05

CARY AVENUE OUTLET.

Back-fill, labor,	\$759 10
Flats excavation, 380 feet long,	95 20
Marsh, excavation, trench 560 feet long,	663 30
Main trench excavation, 1,465 feet long,	2,023 10
Pumping and care of water, labor,	638 10
Sheeting, labor,	\$574 20
lumber,	336 77
	910 97
Pile foundation,	5,424 71
Building centres and material,	125 88
Moving centres, labor,	102 68
Side walls, stone, \$3.44 per cu. yard,	1,528 50
Concrete, labor,	\$388 67
" masons,	148 16
" cement, (272 bbls.)	380 80
" 234 loads gravel,	95 98
" 93 loads sand,	38 13
	1,151 74
Invert, labor,	\$461 00
" masons,	514 50
" 136,101 bricks,	1,225 91
" 412 bbls. cement,	576 80
" 82 loads sand,	33 64
	2,811 85

"Y" BRANCHES USED IN PLACE OF STRAIGHT PIPE, 1888.

Carroll street No. 7, 12x6,	\$2 58
Spruce street No. 56, 12x6	2 58
Carroll street, 10x6	1 60
Broadway No. , 12x6	2 58
Walnut street No. 15x6	3 79
Franklin avenue No. 30, 12x6	2 58
Eastern avenue No. 437, 15x6	3 79
Woodlawn avenue No. 184, 15x6	3 79
Woodlawn avenue No. 15x6	3 79
Clark avenue No. 120, 12x6	2 58
Auburn street, two, 12x6	5 14
Clark avenue No. 144, 12x6	2 58
	\$37 38

NEW CATCH BASINS, 1888.

Woodlawn and Spencer avenues	\$33 50
Broadway, near Fourth, in railroad	40 00
	\$73 50

MISCELLANEOUS, 1888.

Finding John street sewer	20 00
Finding Crescent avenue sewer	3 00
Water proof clothes for cesspools	32 00
Sand	5 00
Diaphram pump, hose and repairs	98 25
Tools and repairs	74 97
Inspection	66 00
Catchbasin cleaning outfits	13 60
Manhole steps	10 00
Sheeting lifts of iron	12 65
Rope	11 04
Lumber	30 00
Moving tool-locker	8 00
Pearl street outlet, dredging	150 00

REPORT OF THE CITY ENGINEER.

31

Marginal street	6 00
Eden street	21 97
Dyke Pond gate and repairs	104 89
Eleanor street	6 60
Woodlawn and Spencer avenues, raising manhole	1 63
	\$355 11

CULVERTS, 1888.

Crescent avenue, near Eleanor street	\$10 00
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CATCH BASINS REPAIRS, 1888.

Washington and Chestnut street	\$20 62
West Third street	10 25
Second and Chestnut streets	34 25
Beacon street	21 12
Congress avenue and Park	4 00
Addison and Eden streets	22 25
Everett avenue and Arlington street	1 00
Williams and Walnut streets	1 00
Second and Broadway	3 00
Eleanor street and Spencer avenue, to grade	5 62
Washington avenue and Winthrop	17 75
Carmel and Bloomingdale streets	10 50
Hawthorn and Bellingham square	11 50
Park and School streets	10 50
Crescent and Washington avenues	4 50
Division street	6 25
Warren street flush tank	1 00
Two Clapp traps	36 00
	\$221 11

DRAINS FROM VACANT LOTS, 1888.

Spruce street	\$2 00
Walnut street	4 00
	\$6 00

Repat

40

City Engineer, Chelsea,

Letter in regard to
cracked stone

apl 8. 1889

Cracked Stone