INSTRUCTIONS
TO
SURVEYORS GENERAL.

PUBLIC LANDS
AND
PRIVATE LAND CLAIMS.

INSTRUCTIONS

OF THE

COMMISSIONER

OF THE

GENERAL LAND OFFICE

TO THE

SURVEYORS GENERAL OF THE UNITED STATES

RELATIVE TO THE

SURVEY OF THE PUBLIC LANDS

AND

PRIVATE LAND CLAIMS.

MAY 3, 1881.

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DEPARTMENT OF THE INTERIOR,
GENERAL LAND OFFICE,
Washington, D. C., May 3, 1881.

GENTLEMEN: The following instructions, including full and minute directions for the execution of surveys in the field, are issued under the authority given me by sections 453, 456, 2398, and 2399 United States Revised Statutes, and must be strictly complied with by yourselves and your deputy surveyors.

Very respectfully,

J. A. WILLIAMSON,
Commissioner.

TO SURVEYORS GENERAL OF THE UNITED STATES.

INTRODUCTORY.

The present system of survey of the public lands was inaugurated by a committee appointed by the Continental Congress, and consisting of the following delegates:

Hon. THOS. JEFFERSON, *Chairman*	Virginia.
Hon. HUGH WILLIAMSON	North Carolina.
Hon. DAVID HOWELL	Rhode Island.
Hon. ELBRIDGE GERRY	Massachusetts.
Hon. JACOB READ	South Carolina.

On the 7th of May, 1784, this committee reported "An ordinance for ascertaining the mode of locating and disposing of lands in the western territory, and for other purposes therein mentioned." This ordinance required the public lands to be divided into "hundreds" of ten geographical miles square, and those again to be subdivided into lots of one mile square each, to be numbered from 1 to 100, commencing in the *northwestern* corner, and continuing from west to east and from east to west consecutively. This ordinance was considered, debated, and amended, and reported to Congress April 26, 1785, and required the surveyors "to divide the said territory into townships of 7 miles square, by lines running due north and south, and others crossing these at right angles. * * * The plats of the townships, respectively, shall be marked by subdivisions into sections of 1 mile square, or 640 acres, in the same direction as the external lines, and numbered from 1 to 49. * * * And these sections shall be subdivided into lots of 320 acres." This is the first record of the use of the terms "township" and "section."

May 3, 1785, on motion of Hon. William Grayson, of Virginia, seconded by Hon. James Monroe, of Virginia, the section respecting the extent of townships was amended by striking out the words "seven miles square" and substituting the words "six miles square." The record of these early sessions of Congress are not very full or complete; but it does not seem to have occurred to the members until the 6th of May, 1785, that a township six miles square could not contain 49 sections of 1 mile square. At that date a motion to amend was made, which provided, among other changes, that a township should contain 36 sections; and the amendment was *lost*. The ordinance as finally passed, however, on the 20th of May, 1785, provided for townships, 6 miles square, containing 36 sections of 1 mile square. The first public surveys were made under this ordinance. The townships, 6 miles square, were laid out in ranges, extending northward from the Ohio River, the townships being numbered from south to north, and the ranges from east to west. The region embraced by the surveys under this law forms a part of the present State of Ohio, and is usually styled "The Seven Ranges." In these initial surveys only the *exterior lines* of the townships were surveyed, but the plats were marked by subdivisions into sections of 1 mile square, and mile corners were established on the township lines. The sections were numbered from 1 to 36, commencing

with No. 1 in the *southeast* corner of the township, and running from *south* to *north* in each tier to No. 36 in the *northwest* corner of the township, as shown in the following diagram:

36	30	24	18	12	6
35	29	23	17	11	5
34	28	22	16	10	4
33	27	21	15	9	3
32	26	20	14	8	2
31	25	19	13	7	1

The surveys were made under the direction of the Geographer of the United States.

The act of Congress approved May 18, 1796, provided for the appointment of a surveyor-general, and directed the survey of the lands northwest of the Ohio River, and above the mouth of the Kentucky River, "in which the titles of the Indian tribes have been extinguished." Under this law *one-half* of the townships surveyed were subdivided into sections "by running through the same, each way, parallel lines at the end of every two miles, and by making a corner on each of said lines at the end of every mile," and it further provided that "the sections shall be numbered, respectively, beginning with the number one in the northeast section and proceeding west and east alternately, through the township, with progressive numbers till the thirty-sixth be completed." This method of numbering sections, as shown by the following diagram, is still in use:

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

The act of Congress approved May 10, 1800, required the "townships west of the Muskingum, which * * * are directed to be sold in quarter townships, to be subdivided into half sections of three hundred and twenty acres each, as nearly as may be, by running parallel lines through the same from east to west, and from south to north, at the distance of one mile from each other, and marking corners, at the distance of each half mile on the lines running from east to west, and at the distance of each mile on those running from south to north. * *

* And the interior lines of townships intersected by the Muskingum, and of all the townships lying east of that river, which have not been heretofore actually subdivided into sections shall also be run and marked. * * * And in all cases where the exterior lines of the townships thus to be subdivided into sections or half sections shall exceed, or shall not extend, six miles, the excess or deficiency shall be specially noted, and added to or deducted from the western and northern ranges of sections or half sections in such township, according as the error may be in running the lines from east to west or from south to north."

The act of Congress approved February 11, 1805, directs the subdivision of the public lands into quarter sections, and provides that all the corners marked in the public surveys shall be established as the proper corners of sections or subdivisions of sections, which they were intended to designate, and that corners of half and quarter sections *not marked* shall be placed as nearly as possible "equidistant from those two corners which stand on the same line." This act further provides that "The boundary lines actually run and marked * * * shall be established as the proper boundary lines of the sections or subdivisions for which they were intended; and the length of such lines as returned by * * * the surveyors * * * shall be held and considered as the true length thereof, and the boundary lines which shall not have been actually run and marked as aforesaid shall be ascertained by running straight lines from the established corners to the opposite corresponding corners; but in those portions of the fractional townships, where no such opposite or corresponding corners have been or can be fixed, the said boundary line shall be ascertained by running from the established corners due north and south or east and west lines, as the case may be, to the * * * external boundary of such fractional township."

The act of Congress approved April 25, 1812, provided "That there shall be established in the Department of the Treasury an office to be denominated the General Land Office; the chief officer of which shall be called the Commissioner of the General Land Office, whose duty it shall be, under the direction of the head of the department, to superintend, execute, and perform all such acts and things touching or respecting the public lands of the United States, and other lands patented or granted by the United States, as have heretofore been directed by law to be done or performed in the office of the Secretary of State, of the Secretary and Register of the Treasury, and of the Secretary of War, or which shall hereafter by law be assigned to the said office."

The act of Congress approved April 24, 1820, provides for the sale of public lands in half quarter sections, and requires that "in every case of the division of a quarter section the line for the division thereof shall run north and south * * * and fractional sections, containing 160 acres and upwards, shall, in like manner, as nearly as practicable, be subdivided into half quarter sections, under such rules and regulations as may be prescribed by the Secretary of the Treasury; but fractional sections containing less than 160 acres shall not be divided."

The act of Congress approved May 24, 1824, provides "That whenever, in the opinion of the President of the United States, a departure from the ordinary mode of surveying land on any river, lake, bayou, or watercourse would promote the public interest, he may direct the surveyor-general in whose district such land is situated, and where the change is intended to be made, under such rules and regulations as the President may prescribe, to cause the lands thus situated to be surveyed

in tracts of two acres in width, fronting on any river, bayou, lake, or watercourse, and running back the depth of forty acres." * * *

The act of Congress approved May 29, 1830, provides for the fine and imprisonment of any person obstructing the survey of the public lands, and for the protection of surveyors, in the discharge of their official duties, by the United States marshal, with sufficient force, whenever necessary.

The act of Congress approved April 5, 1832, directed the subdivision of the public lands into quarter-quarters; that in every case of the division of a half-quarter section the dividing line should run east and west, and that fractional sections should be subdivided under rules and regulations prescribed by the Secretary of the Treasury. Under the latter provision the Secretary directed that fractional sections containing less than 160 acres, or the residuary portion of a fractional section, after the subdivision into as many quarter-quarter sections as it is susceptible of, may be subdivided into lots, each containing the quantity of a quarter-quarter section as nearly as practicable, by so laying down the line of subdivision that they shall be 20 chains wide, which distances are to be marked on the plat of subdivision, as are also the areas of the quarter-quarters and residuary fractions.

The two acts last above mentioned provided that the corners and contents of half-quarter and quarter-quarter sections should be ascertained, as nearly as possible, in the manner and on the principles directed and prescribed in the act of Congress approved February 11, 1805.

The act of Congress approved July 4, 1836, provided for the reorganization of the General Land Office, and that the executive duties of said office "shall be subject to the supervision and control of the Commissioner of the General Land Office under the direction of the President of the United States." The repealing clause is, "That such provisions of the act of the twenty-fifth of April, in the year one thousand eight hundred and twelve, entitled 'An act for the establishment of a General Land Office in the Department of the Treasury' and of all acts amendatory thereof, as are inconsistent with the provisions of this act, be, and the same are hereby, repealed."

From the wording of this act it would appear that the control of the General Land Office was removed from the Treasury Department, and that the Commissioner reported direct to the President, but, as a matter of fact, the Secretary of the Treasury still had supervisory control, for the act of Congress approved March 3, 1849, by which the Department of the Interior was established, provided "That the Secretary of the Interior shall perform all the duties in relation to the General Land Office, of supervision and appeal, now discharged by the Secretary of the Treasury * * *." By this act the General Land Office was transferred to the Department of the Interior, where it still remains.

In 1855 a manual of instructions to surveyors general was prepared, under the direction of the Commissioner of the General Land Office, by John M. Moore, then principal clerk of surveys, and the act of Congress approved May 30, 1862, provided "That the printed manual of instructions relating to the public surveys, prepared at the General Land Office, and bearing the date February twenty-second, eighteen hundred and fifty-five, the instructions of the Commissioner of the General Land Office, and the special instructions of the surveyor-general, when not in conflict with said printed manual or the instructions of said Commissioner, shall be taken and deemed to be a part of every contract for surveying the public lands of the United States."

The instructions contained in this volume are issued under the author-

ity given in the clause in said act providing that "The instructions of the Commissioner of the General Land Office * * * shall be taken and deemed to be a part of every contract for surveying the public lands of the United States."

The following comprise so much of the general laws relating to the survey of the public domain as it is deemed necessary to incorporate in this volume, reference being made by chapter and section to the codification of the Public Land Laws, prepared pursuant to acts of Congress approved March 3, 1879, and June 16, 1880, and by section number to the Revised Statutes of the United States.

CHAPTER TWO.

THE GENERAL LAND OFFICE.

Duties of Commissioner.

SEC. 32. The Commissioner of the General Land Office shall perform, under the direction of the Secretary of the Interior, all executive duties appertaining to the surveying and sale of the public lands of the United States, or in anywise respecting such public lands, and, also, such as relate to private claims of lands, and the issuing of patents for all grants of land under the authority of the government. (R. S. 453.)

Returns and accounts relative to lands.

SEC. 35. All returns relative to the public lands shall be made to the Commissioner of the General Land Office; and he shall have power to audit and settle all public accounts relative to the public lands; and upon the settlement of any such accounts he shall certify the balance, and transmit the account with the vouchers and certificate to the First Comptroller of the Treasury for his examination and decision thereon. (R. S. 456.)

Commissioner to perform duties of surveyor-general, &c.

SEC. 38. Upon the discontinuance of any surveying district the authority, powers and duties in relation to the survey, resurvey, or subdivision of lands therein and all matters and things connected therewith, as previously exercised by the surveyor-general, shall be vested in and devolved upon the Commissioner of the General Land Office; and deputy surveyors or other agents under his direction shall have free access to any field-notes, maps, records, and other papers, turned over to the authorities of any State pursuant to law, for the purpose of making copies thereof, without charge of any kind. (R. S. 2219, 2220.)

Approval of surveying contracts.

SEC. 45. The Commissioner shall approve all contracts for the survey of the public lands. (R. S. 2398.)

Commissioner's instructions deemed part of contract for surveying.

SEC. 46. The instructions issued by the Commissioner of the General Land Office not in conflict with law shall be deemed part of every contract for surveying the public lands. (R. S. 2399.)

Power of Commissioner to make regulations.

SEC. 61. The Commissioner, under the direction of the Secretary of the Interior, is authorized to enforce and carry into execution every part of the public land laws not otherwise specially provided for. (R. S. 2478.)

CHAPTER THREE.

SURVEYS AND SURVEYORS.

Surveyors-general, how and where appointed.

SEC. 77. There shall be appointed by the President, by and with the advice and consent of the Senate, a surveyor-general for the States and Territories herein named, embracing respectively, one surveying district, namely: Louisiana, Florida, Minnesota, Kansas, California, Nevada, Oregon, Nebraska and Iowa, Dakota, Colorado, New Mexico, Idaho, Washington, Montana, Utah, Wyoming, Arizona. (R. S. 2207.)

Residence of surveyor-general.

SEC. 83. Every surveyor-general, while in the discharge of the duties of his office, shall reside in the district for which he is appointed. (R. S. 2414.)

Bond of surveyor-general.

SEC. 84. Every surveyor-general shall, before entering on the duties of his office, execute and deliver to the Secretary of the Interior a bond, with good and sufficient security, for the penal sum of thirty thousand dollars, conditioned for the faithful disbursement, according to law, of all public money placed in his hands, and for the faithful performance of the duties of his office; and the President has discretionary authority to require a new bond and additional security, under the direction of the Secretary of the Interior, for the lawful disbursements of public moneys. (R. S. 2215, 2216.)

Duration of office.

SEC. 85. The commission of each surveyor-general shall cease and expire in four years from the date thereof, unless sooner vacated by death, resignation, or removal from office. (R. S. 2217.)

Continuance of duties and bond after expiration of commission.

SEC. 86. Every surveyor general, except where the President sees cause otherwise to determine, is authorized to continue in the uninterrupted discharge of his regular official duties after the day of expiration of his commission and until a new commission is issued to him for the same office, or until the day when a successor enters upon the duties of such office; and the existing official bond of any officer so acting shall be deemed good and sufficient and in force until the date of the approval of a new bond to be given by him, if recommissioned, or otherwise, for the additional time he may so continue officially to act, pursuant to the authority of this section. (R. S. 2222.)

Transfer of papers and discontinuance of office in case of completed surveys.

SEC. 87. Whenever the surveys and records of any surveying district are completed the surveyor-general thereof shall be required to deliver over to the secretary of state of the respective States, including such surveys, or to such other officer as may be authorized to receive them, all the field-notes, maps, records, and other papers appertaining to land titles within the same; and the office of surveyor-general in every such district shall thereafter cease and be discontinued. (R. S. 2218.)

Devolution of powers upon Commissioner in case of discontinuance.

SEC. 88. In all cases of discontinuance, as provided in the preceding section, the authority, powers, and duties of the surveyor-general in relation to the survey, resurvey, or subdivision of the lands therein, and all matters and things connected therewith shall be vested in and devolved upon the Commissioner of the General Land Office. (R. S. 2219.)

Free access to public records delivered to States and conditions of such delivery.

SEC. 89. Under the authority and direction of the Commissioner of the General Land Office any deputy surveyor or other agent of the United States shall have free access to any such field-notes, maps, records, and other papers for the purpose of taking extracts therefrom or making copies thereof without charge of any kind; but no transfer of such public records shall be made to the authorities of any State until such State has provided by law for the reception and safe-keeping of such public records and for the allowance of free access thereto by the authorities of the United States. (R. S. 2220, 2221.)

General duties of surveyor-general.

SEC. 90. Every surveyor-general shall engage a sufficient number of skillful surveyors as his deputies, to whom he is authorized to administer the necessary oaths upon their appointments. He shall have authority to frame regulations for their direction, not inconsistent with law or the instructions of the General Land Office, and to remove them for negligence or misconduct in office.

Second. He shall cause to be surveyed, measured, and marked, without delay, all base and meridian lines through such points and perpetuated by such monuments, and such other correction parallels and meridians as may be prescribed by law or by instructions from the General Land Office in respect to the public lands within his surveying district, to which the Indian title has been or may be hereafter extinguished.

Third. He shall cause to be surveyed all private land claims within his district after they have been confirmed by authority of Congress, so far as may be necessary to complete the survey of the public lands.

Fourth. He shall transmit to the register of the respective land offices within his district general and particular plats of all lands surveyed by him for each land district; and he shall forward copies of such plats to the Commissioner of the General Land Office.

Fifth. He shall, so far as is compatible with the desk duties of his office, occasionally inspect the surveying operations while in progress in the field, sufficiently to satisfy himself of the fidelity of the execution of the work according to contract, and the actual and necessary expenses incurred by him while so engaged shall be allowed; and where it is incompatible with his other duties for a surveyor-general to devote the time necessary to make a personal inspection of the work in progress, then he is authorized to depute a confidential agent to make such examination, and the actual and necessary expenses of such person shall be allowed and paid for that service, and five dollars a day during the examination in the field; but such examination shall not be protracted beyond thirty days, and in no case longer than is actually necessary; and when a surveyor-general, or any person employed in his office at a regular salary, is engaged in such special service, he shall receive only his necessary expenses in addition to his regular salary. (R. S. 2223.)

Bond of deputy surveyor.

SEC. 91. Every deputy surveyor shall enter into bond, with sufficient security, for the faithful performance of all surveying contracts confined to him; and the penalty of the bond in each case, shall be double the estimated amount of money accruing under such contract, at the rate per mile stipu-

lated to be paid therein. The sufficiency of the sureties to all such bonds shall be approved and certified by the proper surveyor-general. (R. S. 2230.)

Oath of deputy surveyor.

SEC. 92. The surveyors-general, in addition to the oath now authorized by law to be administered to deputies on their appointment to office, shall require each of their deputies, on the return of his surveys, to take and subscribe an oath that those surveys have been faithfully and correctly executed according to law and the instructions of the surveyor-general. (R. S. 2231.)

Suit on bond of deputy surveyor; lien of.

SEC. 93. The district attorney of the United States, in whose district any false, erroneous, or fraudulent surveys have been executed, shall upon the application of the proper surveyor-general, immediately institute suit upon the bond of such deputy, and the institution of such suit shall act as a lien upon any property owned or held by such deputy or his sureties at the time such suit was instituted. (R. S. 2232.)

Duties of register and receiver performed by surveyor-general.

SEC. 98. The President is authorized, in any case where he thinks the public interest may require it, to transfer the duties of register and receiver in any district to the surveyor-general of the surveying district in which such land district is located. (R. S. 2228.)

Rules of survey.

SEC. 99. The public lands shall be divided by north and south lines run according to the true meridian, and by others crossing them at right angles, so as to form townships of six miles square, unless where the line of an Indian reservation, or of tracts of land heretofore surveyed or patented, or the course of navigable rivers may render this impracticable; and in that case this rule must be departed from no further than such particular circumstances require.

Second. The corners of the townships must be marked with progressive numbers from the beginning, each distance of a mile between such corners must be also distinctly marked with marks different from those of the corners.

Third. The township shall be subdivided into sections, containing, as nearly as may be, six hundred and forty acres each, by running through the same, each way, parallel lines at the end of every two miles; and by making a corner on each of such lines, at the end of every mile. The sections shall be numbered, respectively, beginning with the number one in the northeast section and proceeding west and east alternately through the township with progressive numbers till the thirty-six be completed.

Fourth. The deputy surveyors, respectively, shall cause to be marked on a tree near each corner established in the manner described, and within the section, the number of such section, and over it the number of the township within which such section may be; and the deputy surveyors shall carefully note, in their respective field-books, the names of the corner trees marked and the numbers so made.

Fifth. Where the exterior lines of the townships which may be subdived into sections or half sections exceed, or do not extend six miles, the excess or deficiency shall be specially noted, and added to or deducted from the western and northern ranges of sections or half sections in such townships, according as the error may be in running the lines from east to west, or from north to south; the sections and half sections bounded on the northern and western lines of such townships shall be sold as containing only the quantity expressed in the returns and plats, respectively, and all others as containing the complete legal quantity.

Sixth. All lines shall be plainly marked upon trees, and measured with chains, containing two perches, of sixteen and one-half feet each, subdivided into twenty-five equal links; and the chain shall be adjusted to a standard to be kept for that purpose.

Seventh. Every surveyor shall note in his field-book the true situations of all mines, salt-licks, salt-springs, and mill-seats which come to his knowledge; all water-courses over which the line he runs may pass; and also the quality of the lands.

Eighth. These field-books shall be returned to the surveyor-general, who shall cause therefrom a description of the whole lands surveyed to be made out and transmitted to the officers who may superintend the sales. He shall also cause a fair plat to be made of the townships and fractional parts of townships contained in the lands, describing the subdivisions thereof and the marks of the corners. This plat shall be recorded in books to be kept for that purpose; and a copy thereof shall be kept open at the surveyor-general's office for public information, and other copies shall be sent to the places of the sale and to the General Land Office. (R. S. 2395.)

Boundaries and contents of public lands, how ascertained.

SEC. 100. The boundaries and contents of the several sections, half sections, and quarter sections of the public lands shall be ascertained in conformity with the following principles:

First. All the corners marked in the surveys returned by the surveyor-general shall be established as the proper corners of sections, or subdivisions of sections, which they were intended to designate; and the corners of half and quarter sections, not marked on the surveys, shall be placed as nearly as possible equidistant from two corners which stand on the same line.

Second. The boundary lines, actually run and marked in the surveys returned by the surveyor-general, shall be established as the proper boundary lines of the sections

or subdivisions for which they were intended, and the length of such lines as returned, shall be held and considered as the true length thereof. And the boundary lines which have not been actually run and marked shall be ascertained by running straight lines from the established corners to the opposite corresponding corners; but in those portions of the fractional townships, where no such opposite corresponding corners have been or can be fixed, the boundary lines shall be ascertained by running from the established corners due north and south or east and west lines, as the case may be, to the water-course, Indian boundary line, or other external boundary of such fractional township.

Third. Each section or subdivision of section, the contents whereof have been returned by the surveyor-general, shall be held and considered as containing the exact quantity expressed in such return; and the half-sections and quarter-sections, the contents whereof shall not have been thus returned, shall be held and considered as containing the one-half or the one-fourth part, respectively, of the returned contents of the section of which they may make part. (R. S. 2395.)

Lines of division of half-quarter sections, how run.

SEC. 101. In every case of the division of a quarter-section the line for the division thereof shall run north and south, and the corners and contents of half-quarter sections which may thereafter be sold shall be ascertained in the manner and on the principles directed and prescribed by the section preceding, and fractional sections containing one hundred and sixty acres or upwards shall in like manner, as nearly as practicable, be subdivided into half quarter-sections, under such rules and regulations as may be prescribed by the Secretary of the Interior, and in every case of a division of a half-quarter section, the line for the division thereof shall run east and west, and the corners and contents of quarter-quarter sections, which may thereafter be sold, shall be ascertained, as nearly as may be, in the manner and on the principles directed and prescribed by the section preceding; and fractional sections containing fewer or more than one hundred and sixty acres shall in like manner, as nearly as may be practicable, be subdivided into quarter-quarter sections, under such rules and regulations as may be prescribed by the Secretary of the Interior. (R. S. 2397.)

Variance in shape of surveys on rivers, &c.

SEC. 102. Whenever, in the opinion of the President, a departure from the ordinary method of surveying land on any river, lake, bayou, or water-course would promote the public interest, he may direct the surveyor-general, in whose district such land is situated, and where the change is intended to be made, to cause the lands thus situated to be surveyed in tracts of two acres in width, fronting on any river, bayou, lake, or water-course, and running back the depth of forty acres; which tracts of land so surveyed shall be offered for sale entire, instead of in half-quarter sections, and in the usual manner, and on the same terms in all respects as the other public lands of the United States. (R. S. 2407.)

Extension of public surveys over mineral lands.

SEC. 106. The public surveys shall extend over all mineral lands, and all subdividing of surveyed lands into lots less than one hundred and sixty acres may be done by county and local surveyors at the expense of claimants; but nothing in this section contained shall require the survey of waste or useless lands. (R. S. 2406.)

What instructions to be deemed part of contract.

SEC. 107. The printed manual of instructions relating to the public surveys, prepared at the General Land Office, and bearing date February twenty-second, eighteen hundred and fifty-five, the instructions of the Commissioner of the General Land Office, and the special instructions of the surveyor-general, when not in conflict with such printed manual or the instructions of the Commissioner, shall be taken and deemed to be a part of every contract for surveying the public lands. (R. S. 2399.)

Contracts for surveys of public lands, when binding.

SEC. 111. Contracts for the survey of the public lands shall not become binding upon the United States until approved by the Commissioner of the General Land Office, except in such cases as the Commissioner may otherwise specially order. (R. S. 2398.)

Price of surveys, how established; cost of surveying private claims and railroad grants to be refunded.

SEC. 112. The Commissioner of the General Land Office has power, and it shall be his duty to fix the prices per mile for public surveys, which shall in no case exceed the maximum established by law; and, under instructions to be prepared by the Commissioner, an accurate account shall be kept by each surveyor-general of the cost of surveying and plotting private land claims, to be reported to the General Land Office, with the map of such claim; and patents shall not issue for any such private claim, nor shall any copy of such survey be furnished, until the cost of survey and platting has been paid into the Treasury by the claimant or other party; and before any land granted to any railroad company by the United States shall be conveyed to such company or any persons entitled thereto, under any of the acts incorporating or relating to said company, unless such company is exempted by law from the payment of such cost, there shall first be paid into the Treasury of the United States the cost of surveying, selecting, and conveying the same by the said company or persons in interest. (R. S. 2400.)

When survey may be had by settlers in township.

SEC. 115. When the settlers in any township, not mineral or reserved by government, desire a survey made of the same, under the authority of the surveyor-general, and file an application therefor in writing and deposit in a proper United States depository to the credit of the United States, a sum sufficient to pay for such survey, together with all expenses incident thereto, without cost or claim for indemnity on the United States, it may be lawful for the surveyor-general, under such instructions as may be given him by the Commissioner of the General Land Office, and in accordance with law, to survey such township and make return thereof to the general and proper local land office, provided the township so proposed to be surveyed is within the range of the regular progress of the public surveys embraced by existing standard lines or bases for the township and subdivisional surveys. (R. S. 2401.)

Deposit for expenses of surveys deemed an appropriation, &c.

SEC. 116. The deposit of money in a proper United States depository, under the provisions of the preceding section, shall be deemed an appropriation of the sums so deposited for the objects contemplated by that section and the Secretary of the Treasury is authorized to cause the sums so deposited to be placed to the credit of the proper appropriations for the surveying service; but any excesses in such sums over and above the actual cost of the surveys, comprising all expenses incident thereto, for which they were severally deposited, shall be repaid to the depositors respectively. (R. S. 2402.)

Settlers' deposits for surveys to go in part payment of lands, and are assignable.

SEC. 117. Where settlers make deposits in accordance with the provisions of section one hundred and fifteen, the amount so deposited shall go in part payment for their lands situated in the townships, the surveying of which is paid for out of such deposits; or the certificates issued for such deposits may be assigned by indorsement and be received in payment for any public lands of the United States entered by settlers under the pre-emption and homestead laws of the United States, and not otherwise. (R. S. 2403.)

Surveyors-general to survey private land claims when confirmed, &c.

SEC. 118. Each surveyor-general, when thereunto duly authorized by law, shall cause all confirmed private land claims within his district to be accurately surveyed, and shall transmit plats and field-notes thereof to the Commissioner of the General Land Office for his approval. When publication of such surveys is authorized by law, the proof thereof, together with any objections properly filed, and all evidence submitted either in support of or in opposition to the approval of any such survey, shall also be transmitted to said Commissioner. (R. S. 2447.)

Penalty for interrupting surveys.

SEC. 120. Every person who in any manner, by threat or force, interrupts, hinders, or prevents the surveying of the public lands, or of any private land claim which has or may be confirmed by the United States, by the persons authorized to survey the same, in conformity with the instructions of the Commissioner of the General Land Office, shall be fined not less than fifty dollars, nor more than three thousand dollars, and be imprisoned not less than one nor more than three years. (R. S. 2412.)

Protection of surveyor by marshal of district.

SEC. 121. Whenever the President is satisfied that forcible opposition has been offered, or is likely to be offered, to any surveyor or deputy surveyor in the discharge of his duties in surveying the public lands, it may be lawful for the President to order the marshal of the State or district, by himself or deputy, to attend such surveyor or deputy surveyor with sufficient force to protect such officer in the execution of his duty, and to remove force should any be offered. (R. S. 2413.)

Surveyors to explore and select timber lands to reserve for use of the Navy.

SEC. 122. The President is authorized to appoint surveyors of public lands, who shall explore such vacant and unappropriated lands of the United States as produce the live-oak and red-cedar timbers, and shall select such tracts or portions thereof, where the principal growth is of either of such timbers, as in the judgment of the Secretary of the Navy may be necessary to furnish for the Navy a sufficient supply of the same. Such surveyors shall report to the President the tracts by them selected, with the boundaries ascertained and accurately designated by actual survey or water-courses. (R. S. 2459.)

APPOINTMENT OF DEPUTY SURVEYORS.

Sec. 2223 U. S. Revised Statutes provides that "Every surveyor-general shall engage a sufficient number of skillful surveyors as his deputies, to whom he is authorized to administer the necessary oaths upon their appointments. He shall have authority to frame regulations for their direction, not inconsistent with law or the instructions of the General Land Office, and to remove them for negligence or misconduct in office."

Certificate.

I, ——— ———, hereby certify that, in my opinion, the sureties to the above bond are sufficient, and I hereby approve the same.

———— ————,
U. S. Surveyor-General for ———.

1. The bond must be dated the date it is signed by all the parties thereto.
2. The names of all the parties executing the bond and of the witnesses thereto must be written in full.
3. The affidavits of sureties must be made before some officer (preferably an officer of the United States) duly authorized to administer oaths.
4. The sufficiency of sureties must be certified to by the surveyor-general.
5. All erasures, mutilations, and interlineations must be avoided.
6. The amount of bond must be *at least* double the estimated amount that will be due to the deputy surveyor upon the completion of the first contract made under the same; and whenever the estimated amount that will be due the deputy surveyor on any contract or contracts under any bond shall equal one-half the sum named in such bond, subsequent contracts must be made under a new bond, *e. g.*, the bond being for $30,000, and the deputy surveyor having had three contracts of $5,000, each, under such bond, if a further contract is given him, he must execute a new bond to cover same and subsequent contracts.

The deputy surveyor having been duly commissioned, and his letter of acceptance, oath of office, and official bond filed in the surveyor-general's office, contracts for surveys may then be entered into between the surveyor-general and such deputy surveyor, in accordance with the following form:

FORM OF CONTRACT.

This agreement, made this —— day of ———, 18—, by and between ——— ——— surveyor-general of the United States for ———, acting for and in behalf of the United States, of the one part, and ——— ———, deputy surveyor, of the other part, (a bond for the faithful performance of this and other contracts having been executed by the said ——— ———, deputy surveyor, as principal, and ——— ———, ——— ———, as sureties, and dated the —— day of ———, 18—,) witnesseth:

That the said ——— ———, for and in consideration of the conditions, terms, provisions, and covenants hereinafter expressed, and according to the true intent and meaning thereof, doth hereby covenant and agree with the said ——— ———, in his capacity aforesaid, that he, the said ——— ———, in his own proper person, with the assistance of such compassmen, chainmen, axmen, flag-bearers, and others, as may be necessary, in strict conformity with the laws of the United States, the printed manual of surveying instructions, and other surveying instructions issued by the Commissioner of the General Land Office, and with such special instructions as he may receive from the surveyor-general in conformity therewith (all of said instructions being hereby incorporated with and made a part of this contract), will well, truly, and faithfully survey, mark, and establish ——— ———, or such other lines of survey as he may be authorized to substitute for those named above, in accordance with instructions and subject to the approval of the surveyor-general and the Commissioner of the General Land Office, and that he will complete these surveys in the manner aforesaid, and return the true field-notes thereof to the office of the said surveyor-general, on or before the —— day of ———, 18—, on penalty of forfeiture and paying to the United States the sum of ——— dollars, lawful money of the United States (being double the estimated amount which would be due by the United States to the said ——— ——— upon the completion of the surveys named in this contract), if default be made in any of the foregoing conditions.

And it is further expressly stipulated and made a condition of this contract, that the surveys herein described shall not be commenced before the —— day of ———, 18—, or before said ——— ——— shall have been officially notified by the surveyor-general of the approval of this contract by the Commissioner of the General Land Office.

And the said ——— ———, in his official capacity aforesaid, covenants and agrees with the said ——— ———, that on the completion of the surveys above named, in manner aforesaid, there shall be paid to the said ——— ———, by the Treasury Department of the United States, as a full compensation for all work performed under this agreement, at the rate of ——— dollars for base, standard, meridian, and meander lines, ——— dollars for township lines, and ——— dollars for section lines, except where the lines of survey pass over mountainous lands, or lands heavily timbered, or covered with dense undergrowth, and in such case at the rate of ——— dollars for base, standard, meridian, and meander lines, ——— dollars for township lines, and ——— dollars for section lines, per mile, for every mile and part of a mile actually run and marked in the field, *random lines and offsets not included.*

It is further agreed by and between the parties to this agreement that no account shall be paid unless properly certified by ——— ———, in his official capacity aforesaid (or by his successor in office in such official capacity), that the surveys are in accordance with the instructions herein referred to and the provisions of this agreement, and until approved plats and certified transcripts of field-notes of the surveys for which the accounts are rendered are filed in the General Land Office.

And it is further understood and agreed by and between the parties to this agreement that the said surveys will not be approved by the said ——— ———, in his official capacity aforesaid (or by his successor in office in such official capacity), unless they shall be found to be in exact accordance with the instructions hereinbefore specified: *Provided, also,* That no member of Congress, or subcontractor, shall have any part or interest in this contract, and that no payment shall be made for any surveys not executed by the said deputy surveyor ——— ——— in his own proper person.

In testimony whereof the parties to these articles of agreement have hereunto set their hands and seals, the day and year and place specified, as follows:

The surveyor-general at ———, county of ———, ——— of ———, the —— day of ———, 18—.

The deputy surveyor at ———, county of ———, ——— of ———, the —— day of ———, 18—.

——— ———, [SEAL.]
United States Surveyor-General for ———.
——— ———, [SEAL.]
United States Deputy Surveyor.

Signed, sealed, and acknowledged before us:
Witnesses to surveyor-general's signature:
——— ———,
Residence, ———.
——— ———,
Residence, ———.
Witnesses to deputy surveyor's signature:
——— ———,
Residence, ———.
——— ———,
Residence, ———.

1. Where both parties sign the contract on the same day it will be dated that day.
2. Where parties sign the contract on different days it will be dated the day when the last signature is affixed.
3. The names of the surveyor-general, deputy surveyor, sureties, and witnesses must be written in full, and the residence of witnesses written after their signatures.
4. A full description of the surveys embraced in the contract must be written in the blank space left for that purpose.
5. When contract is made under the appropriation for public surveys, the date when surveys are required to be completed and field-notes returned shall not be later than the end of the fiscal year for which appropriation is made; and the date when surveys can be commenced shall not be earlier than the commencement of such fiscal year, except in cases where the appropriation is made immediately available.
6. The rates named in contract must not exceed those fixed by law.
7. The signatures of the surveyor-general and of the deputy surveyor must each be witnessed by two persons.
8. All erasures, mutilations, and interlineations must be avoided.

The substitution provided for in above form of contract is to be made only in cases where townships or portions of townships included in the contract for subdivision are found to be unsurveyable under instructions; and in such cases other townships which are surveyable may be substituted, preference being given to those upon which settlement has been made, or toward which settlement is tending.

In case the deputy finds it necessary to make such substitution, he must forward to the surveyor-general a written report of same at the earliest practicable date. Such report must state fully all of the circumstances of the case and the reasons for substitution, and if subsequent investigation should prove that the substitution was unnecessary and should not have been made, payment for the survey of such substituted townships will not be made.

SYSTEM OF RECTANGULAR SURVEYING.

1. The public lands of the United States are ordinarily surveyed into rectangular tracts, bounded by lines conforming to the cardinal points.

2. The public lands shall be laid off, in the first place, into bodies of land of 24 miles square, as near as may be. This shall be done by the extension of standard lines from the principal meridian every 24 miles, and by the extension, from the base and standard lines, of auxiliary meridians every 24 miles. Thereafter they shall be laid off into bodies of land of 6 miles square, as near as may be, called *townships*, containing as near as may be 23,040 acres. The townships shall be subdivided into 36 tracts, called sections, each containing as near as may be 640 acres. Any number or series of contiguous townships, situate north or south of each other, constitute a *range*.

The law requires that the lines of the public surveys shall be governed by the true meridian, and that the townships shall be *six miles square*—two things involving in connection a mathematical impossibility—for, strictly to conform to the meridian, necessarily throws the township out of square, by reason of the convergency of meridians, and hence, by adhering to the true meridian, results the necessity of departing from the strict requirements of law, as respects the precise area of townships and the subdivisional parts thereof, the township assuming something of a trapezoidal form, which inequality develops itself more and more as such, the higher the latitude of the surveys. It is doubtless in view of these circumstances that the law provides (see section 2 of the act of May 18, 1796) that the sections of a mile square shall contain the quantity of 640 acres, *as nearly as may be;* and, moreover, provides (see section 3 of the act of May 10, 1800) in the following words: "And in all cases where the exterior lines of the townships, thus to be subdivided into sections or half sections, shall exceed, or shall not extend 6 miles, the excess or deficiency shall be specially noted, and added to or deducted from the western or northern ranges of sections or half sections in such township, according as the error may be in running the lines from east to west, or from south to north; the sections and half sections bounded on the northern and western lines of such townships shall be sold as containing only the quantity expressed in the returns and plats, respectively, and all others as containing the complete legal quantity."

The accompanying diagram, marked A, and the specimen field-notes pertaining to the same, will serve to illustrate the method of running lines to form tracts of land 24 miles square, as well as the method of running out the exterior lines of townships, and the order and mode of subdividing townships will be found illustrated in the accompanying specimen field-notes, conforming with the township diagram B. The method here presented is designed to insure as full a compliance with all the requirements, meaning, and intent of the surveying laws as, it is believed, is practicable.

The section lines are surveyed from *south* to north on true meridians, and from *east* to west, in order to throw the excesses or deficiencies in measurements on the north and west sides of the township, as required by law. In case where a township has been partially surveyed, and it is necessary to complete the survey of the same, or where the character of the land is such that only the north or west portions of the township can be surveyed, this rule can not be strictly adhered to, but, in such cases, must be departed from only so far as is absolutely necessary. It will also be necessary to depart from this rule where surveys close upon

State or Territorial boundaries, or upon surveys extending from different meridians.

3. The townships are to bear numbers in respect to the base line, either north or south of it; and the tiers of townships called "ranges" will bear numbers in respect to the meridian line according to their relative position to it, either on the east or west.

4. The thirty-six sections into which a township is subdivided are numbered, commencing with number *one* at the *northeast* angle of the township, and proceeding west to number six, and thence proceeding east to number twelve, and so on, alternately, until the number thirty-six in the southeast angle. In all cases of surveys of fractional townships, the sections should bear the same numbers as they would if the towns hip was full.

5. Standard parallels shall be established at intervals of every 24 miles, north and south of the base line, and auxiliary meridians at intervals of every 24 miles, east and west of the principal meridian; the object being to confine the errors resulting from convergence of meridians, and inaccuracies in measurements, within the tracts of lands bounded by the lines so established.

6. The survey of all principal base and meridian, standard parallels, and auxiliary meridian, and township lines must be made with an instrument operating independently of the magnetic needle. Burt's *improved solar compass*, or other instrument of equal utility, must be used of necessity in such cases; and it is deemed best that such instrument should be used under all circumstances. Where the needle can be relied on, however, the ordinary compass may be used in subdividing and meandering. Whenever deputies use instruments with magnetic apparatus only, they must test the accuracy of their work and the condition of their instruments by at least three observations upon a circumpolar star, upon different days, between the commencement and the close of surveying operations in any given township. Deputies using instruments with solar apparatus are not required to make observations of the star Polaris, but they must test their instruments by taking the latitude daily, weather permitting, in running base, standard, meridian, and range lines, and upon three different days during the execution of subdivisional surveys in each township. They must make complete records in their field-notes, under proper dates, of the making of all observations in compliance with these instructions, showing the style and condition of the instrument in use, and the angle formed, by comparing the line run with the meridian as by observation determined.

7. The construction and adjustments of all surveying instruments used in the surveying of the public lands of the United States must be tested at least once a year, and oftener if necessary, by comparison with the true meridian, established under the direction of the surveyor general of the district; and the instruments must be so modified in construction, or in such a way corrected, as may be necessary to produce the closest possible approximation to accuracy and uniformity in the operation of all such instruments. A record will be made of such examinations, showing the number and style of the instrument, name of the maker, the quantity of instrumental error discovered by comparison, in either solar or magnetic apparatus, or both, and means taken for correction. The surveyor-general will allow no surveys to be made until the instruments to be used therefor have been approved by him.

8. The township lines and the subdivision lines will usually be measured by a two-pole chain of 33.03 feet in length, consisting of 50 links, and each link being 7 inches and ninety-two hundredths of an inch long.

On uniform and level ground, however, the four-pole chain may be used. The measurements will, however, always be represented according to the four-pole chain of 100 links. The four-pole chains must be adjusted to lengths of 66.06 feet. The object in adding six-hundredths of a foot to the 66 feet of a four-pole chain is to assure thereby that 66 feet will be set off upon the earth's surface without the application of a greater strain than about 20 pounds by the chainmen, thus providing for loss by vertical curvature of the chain, and at the same time avoiding the uncertain results attending the application of strains taxing its elasticity. The deputy surveyor must provide himself with a measure of the standard chain kept at the office of the surveyor-general, to be used by him as a field standard. The chain in use must be compared and adjusted with this field standard each working day, and such field standard must be returned to the surveyor-general's office for examination when his work is completed.

OF TALLY PINS.

9. You will use eleven tally pins made of steel, not exceeding 14 inches in length, weighty enough toward the point to make them drop perpendicularly, and having a ring at the top, in which is to be fixed a piece of red cloth, or something else of conspicuous color, to make them readily seen when stuck in the ground.

PROCESS OF CHAINING.

10. In measuring lines with a two-pole chain, every *five* chains are called "a *tally;*" and in measuring lines with a four-pole chain, every *ten* chains are called "a *tally,*" because at that distance the last of the ten tally pins with which the forward chainman set out will have been stuck. He then cries "tally;" which cry is repeated by the other chainman, and each registers the distance by slipping a thimble, button, or ring of leather, or something of the kind, on a belt worn for that purpose, or by some other convenient method. The hind chainman then comes up, and having counted in the presence of his fellow the tally pins which he has taken up, so that both may be assured that none of the pins have been lost, he then takes the forward end of the chain, and proceeds to set the pins. Thus the chainmen alternately change places, each setting the pins that he has taken up, so that one is forward in all the odd, and the other in all the even tallies. Such procedure, it is believed, tends to insure accuracy in measurement, facilitates the recollection of the distances to objects on the line, and renders a mis-tally almost impossible.

LEVELING THE CHAIN AND PLUMBING THE PINS.

11. The length of every line you run is to be ascertained by precise horizontal measurement, as nearly approximating to an air line as is possible in practice on the earth's surface. This all-important object can only be attained by a rigid adherence to the three following observances:

1. Ever keeping the chain *stretched* to its utmost degree of tension on even ground.

2. On uneven ground, keeping the chain not only stretched as aforesaid, but horizontally *leveled.* And when ascending and descending steep ground, hills, or mountains, the chain will have to be *shortened* to

one-half its length (and sometimes more), in order accurately to obtain the true horizontal measure.

3. The careful plumbing of the tally pins, so as to attain precisely *the spot* where they should be stuck. The more uneven the surface, the greater the caution needed to set the pins.

MARKING LINES.

12. All lines on which are to be established the legal corner boundaries are to be marked after this method, viz: Those trees which may intercept your line must have two chops or notches cut on each side of them without any other marks whatever. These are called "*sight trees*" or "*line trees.*" A sufficient number of other trees standing within 50 links of the line, on either side of it, are to be *blazed* on two sides diagonally, or quartering toward the line, in order to render the line conspicuous, and readily to be traced, the blazes to be opposite each other, coinciding in direction with the line where the trees stand very near it, and to approach nearer each other the farther the line passes from the blazed trees. Due care must ever be taken to have the lines so well marked as to be readily followed, and to cut the blazes deep enough to have recognizable scars as long as the trees stand.

Where trees 2 inches or more in diameter are found, the required blazes must not be omitted.

Bushes on or near the line should be bent at right angles therewith, and receive a blow of the ax at about the usual height of blazes from the ground sufficient to leave them in a bent position, but not to prevent their growth.

ON TRIAL, OR RANDOM LINES,

the trees are not to be blazed, unless occasionally, from indispensable necessity, and then it must be done so guardedly as to prevent the possibility of confounding the marks of the trial line with the *true.* But bushes and limbs of trees may be lopped, and *stakes set* on the trial or random line, at every *ten* chains, to enable the surveyor on his return to follow and correct the trial line and establish therefrom the *true line.* To prevent confusion, the temporary stakes set on the trial or random lines must be *pulled up* when the surveyor returns to establish the true line.

INSUPERABLE OBJECTS ON LINE—WITNESS POINTS.

13. Under circumstances where your course is obstructed by impassable obstacles, such as ponds, swamps, marshes, lakes, rivers, creeks, &c., you will prolong the line across such obstacles by taking the necessary right angle offsets; or, if such be inconvenient, by a traverse or trigonometrical operation, until you regain the line on the opposite side. And in case a north and south, or a true east and west, line is regained in advance of any such obstacle, you will prolong and mark the line back to the obstacle so passed, and state all the particulars in relation thereto in your field-book. And at the intersection of lines with both margins of impassable obstacles, you will establish a *witness point* (for the purpose of perpetuating the intersections therewith), by setting a post, and giving in your field-book the course and distance therefrom to two trees on opposite sides of the line, each of which trees you will mark with a blaze and notch facing the post; but on the margins of navigable water-courses, or navigable lakes, you will mark the trees with the proper number of the fractional section, township and range.

☞ The best marking tools adapted to the purpose must be provided for marking neatly and *distinctly* all the letters and figures required to be made at corners, *arabic* figures being used exclusively; and the deputy is always to have at hand the necessary implements for keeping his marking irons in order.

ESTABLISHING CORNERS.

To procure the faithful execution of this portion of a surveyor's duty is a matter of the utmost importance. After a true coursing and most exact measurements the establishment of corners is the consummation of the work. If, therefore, the corner be not perpetuated in a permanent and workmanlike manner the *great aim* of the surveying service will not have been attained.

The following are the different points for perpetuating corners, viz:

1. For township boundaries, at intervals of every 6 miles.
2. For section boundaries, at intervals of every mile, or 80 chains.
3. For quarter-section boundaries, at intervals of every half mile, or 40 chains. Exceptions, however, occur as fully set forth hereafter in that portion of the manual showing the manner of running township lines and method of subdividing.
4. Meander corners are established at all those points where the lines of the public surveys intersect the banks of such rivers, bayous, lakes, or islands as are by law directed to be meandered.

DESCRIPTION OF CORNERS.

The following is the form and language to be used by deputy surveyors in describing the establishment of corners in their field-notes, and their work in the field must strictly comply with the same.

STANDARD TOWNSHIP CORNERS.

Stone with Pits and Mound.

SEC. 1. Set a — stone —×—×— ins. — ins. in the ground, for Standard Cor. to (e. g.) Tps. 5 N., R's 2 & 3 W., marked S. C. with 6 notches on N., E. & W. edges, dug pits 24×18 ×12 ins. crosswise on each line, N., E. & W. of stone 6 ft. dist. and raised a mound of earth, 2½ ft. high, 5 ft. base alongside.

Stone with Mound of Stone.

SEC. 2. Set a — stone —×—×— ins. — ins. in the ground, for Standard Cor. to (e. g.) Tps. 5 N., R's 2 & 3 W., marked S. C., with 6 notches on N., E. & W. edges, and raised a mound of stone alongside. Pits impracticable.

Stone with Bearing Trees.

SEC. 3. Set a — stone —×—×— ins. — ins. in the ground, for Standard Cor. to (e. g.) Tps. 5 N., R's 2 & 3 W., marked S. C., with 6 notches on N., E. & W. edges, from which

A —, — ins. diam. bears N —° E.— lks., dist. marked T. 5 N. R. 2 W. S. 31, B. T.

A —, — ins. diam., bears N. —° W. — lks., dist. marked T. 5 N. R. 3 W. S. 36, B. T.

A —, — ins. diam., bears S —° W. — lks. dist. marked T. 4 N. R. 3 W. S. 1, B. T.

Post in Mound.

SEC. 4. Set a post, 4½ ft. long, 4 ins. square, with marked stone (charred stake or quart of charcoal), 12 ins. in the ground, for Standard Cor. to (e. g.) Tps. 5 N., R's 2 & 3 W., marked S. C. T. 5 N. on N.

R. 2 W. S. 31, on E. and

R. 3 W. S. 36 on W. faces, with 6 notches on N., E. & W. faces, dug pits, 24×18×12 ins. crosswise on each line, N., E. & W. of post, 6 ft. dist. and raised a mound of earth 2½ ft. high, 5 ft. base, around post.

Post with Bearing Trees.

SEC. 5. Set a post, 4½ ft. long, 4 ins. square, 24 ins. in the ground, for Standard Cor. to (e. g.) Tps. 5 N., R's 2 & 3 W. marked

S. C. T. 5 N. on N.

R. 2 W. S. 31, on E. and

R. 3 W. S. 36 on W. faces, with 6 notches on N., E. & W. faces; from which

A —, — ins. diam., bears N — ° E. — lks., dist. marked T. 5 N. R. 2 W. S. 31, B. T.

A —, — ins., diam., bears N — ° W. — lks., dist. marked T. 5 N. R. 3 W. S. 36, B. T.

A —, — ins. diam., bears S — ° W. — lks., dist. marked T. 4 N. R. 3 W. S.1, B. T.

Mound without Post or Stone.

SEC. 6. Deposited a marked stone (charred stake or quart of charcoal) 12 ins. in the ground, for Standard Cor. to (e. g.) Tps. 5 N., R's 2 & 3 W., dug pits. 24×18×12 ins. crosswise on each line, N., E. & W. of cor., 6 ft. dist. and raised a mound of earth 2½ feet high, 5 ft. base, over it. In E. pit drove a stake 2 ins. square, 2 ft. long, 12 ins. in the ground, marked

S. C. T. 5 N. on N.

R. 2 W. S. 31, on E. and

R. 3 W. S. 36 on W. faces, with 6 notches on N., E. & W. faces.

Tree Corner without Bearing Trees.

SEC. 7. A—, — ins. diam., which I marked (e. g.) S. C. T. 5 N. on N.

R. 2 W. S. 31, on E. and

R. 3 W. S. 36 on W. faces, with 6 notches on N., E. & W. faces, dug pits 24×18×12 ins. crosswise on each line, N., E. & W. of tree 6 ft. dist., and raised a mound of earth around tree, for Standard Cor. to Tps. 5 N., R's 2 & 3 W.

Tree Corner with Bearing Trees.

SEC. 8. A—, —ins. diam., which I marked (e. g.) T. 5 N. S. C. on N.

R. 2 W. S. 31, on E. and

R. 3 W. S. 36 on W. faces, with 6 notches on N., E. & W. faces, for Standard Cor. to Tps. 5 N., R's 2 & 3 W.; from which

A—, —ins. diam., bears N — ° E. — lks. dist. marked T. 5 N. R. 2 W. S. 31, B. T.

A—, —ins. diam., bears N — ° W. — lks. dist. marked T. 5 N. R. 3 W., S. 36, B. T.

A—, —ins. diam., bears S — ° W. — lks. dist., marked T. 4 N. R. 3 W. S. 1, B. T.

CLOSING TOWNSHIP CORNERS.

Stone with Pits and Mound.

SEC. 1. Set a — stone — × — × — ins. — ins. in the ground for Closing Cor. to (e. g.) Tps. 4 N., R's 2 & 3 W., marked C. C. with 6 notches on S. E. & W. edges, dug pits, 24×18×12 ins., crosswise on each line, S., E. & W. of stone, 6 ft. dist., and raised a mound of earth, 2½ ft. high, 5 ft. base alongside.

Stone with Mound of Stone.

SEC. 2. Set a — stone — × — × — ins. — ins. in the ground for Closing Cor. to (e. g.) Tps. 4 N., R's 2 & 3 W., marked C. C. with 6 notches on S. E. and W. edges, and raised a mound of stone alongside. Pits impracticable.

Stone with Bearing Trees.

SEC. 3. Set a — stone — × — × — ins. — ins. in the ground for Closing Cor. to (e. g.) Tps. 4 N., R's 2 & 3 W., marked C. C. with 6 notches on S., E., & W. edges; from which

A —, — ins. diam. bears S — ° E. — lks. dist. marked T. 4 N. R. 2 W. S. 6, B. T.

A —, — ins. diam. bears S — ° W. — lks. dist. marked T. 4 N. R. 3 W. S. 1, B. T.

A —, — ins. diam. bears N — ° W. — lks. dist. marked T. 5 N. R. 2 W. S. 31, B. T.

Post in Mound.

SEC. 4. Set a post, 4½ ft. long, 4 ins. square, with marked stone (charred stake or quart of charcoal) 12 ins. in the ground for Closing Cor. to (e. g.) Tps. 4 N., R's 2 & 3 W., marked

C. C. T. 4 N. on S.

R. 2 W. S. 6, on E. and

R. 3 W. S. 1 on W. faces, with 6 notches on S., E., & W. faces, dug pits 24 × 18 × 12 ins., crosswise on each line, S., E., & W. of post, 6 ft. dist., and raised a mound of earth 2½ ft. high, 5 ft. base, around post.

Post with Bearing Trees.

SEC. 5. Set a post, 4½ ft. long, 4 ins. square, 24 ins. in the ground, for Closing Cor. to (e. g.) Tps. 4 N., R's 2 & 3 W., marked

C. C. T. 4 N. on S.

R. 2 W. S. 6, on E. and

R. 3 W. S. 1 on W. faces, with 6 notches on S., E. & W. faces; from which

A —, — ins. diam. bears S — ° E. — lks. dist. marked T. 4 N. R. 2 W. S. 6, B. T.

A —, — ins. diam. bears S — ° W. — lks. dist. marked T. 4 N. R. 3 W. S. 1, B. T.

A —, — ins. diam. bears N — ° W. — lks. dist. marked T. 5 N. R. 2 W. S. 31, B. T.

Mound without Post or Stone.

SEC. 6. Deposited a marked stone (charred stake or quart of charcoal) 12 ins. in the ground, for Closing Cor. to (e. g.) Tps. 4 N., R's 2 & 3 W., dug pits 24 × 18 × 12 ins. crosswise on each line, S., E., & W. of corner, 6 ft. dist., and raised a mound of earth 2½ ft. high, 5 ft. base, over it. In E. pit drove a stake 2 ins. square, 2 ft. long, 12 ins. in the ground, marked

C. C. T. 4 N. on S.

R. 2 W. S. 6, on E. and

R. 3 W. S. 1 on W. faces, with 6 notches on S., E. & W. faces.

Tree Corner without Bearing Trees.

SEC. 7. A—, — ins. diam., which I marked (e. g.) C. C. T. 4 N. on S.

R. 2 W. S. 6, on E. and

R. 3 W. S. 1 on W. faces, with 6 notches on S., E. & W. faces, dug pits 24 × 18 × 12 ins. crosswise on each line S. E. & W. of tree, 6 ft. dist. and raised a mound of earth around tree, for Closing Cor. to Tps. 4 N. R's. 2 & 3, W.

Tree Corner with Bearing Trees

SEC. 8. A —, — ins. diam., which I marked (e. g.) C. C. T. 4 N. on S.

R. 2 W. S. 6, on E. and

R. 3 W. S. 1 on W. faces, with 6 notches on S., E. & W. faces for Closing Cor. to Tps. 4 N., R's 2 & 3 W.; from which

A —, — ins. diam. bears S — ° E. — lks. dist. marked T. 4 N. R. 2 W. S. 6, B. T.

A —, — ins. diam. bears S — ° W. — lks. dist. marked T. 4 N. R. 3 W. S. 1, B. T.

A —, — ins. diam. bears N— ° W.— lks. dist. marked T. 5 N. R. 2 W. S. 31, B. T.

SEC. 9. All Closing Township Corners must be connected with the nearest corner on the Standard line.

STANDARD SECTION CORNERS.

SEC. 1. Set a — stone — × — × ins., in the ground, for Standard Cor. to (e. g.) Secs. 35 & 36, marked S. C., with 1 notch on E. and 5 notches on W. edges, dug pits, 18×18×12 ins., N., E. & W. of stone, 5½ ft. dist., and raised a mound of earth, 2 ft. high, 4½ ft. base alongside. Stone with Pits and Mound.

SEC. 2. Set a — stone — × — × — ins., — ins. in the ground, for Standard Cor. to (e. g.) Secs. 33 & 34, marked S. C., with 3 notches on E. & W. edges, and raised a mound of stone alongside. Pits impracticable. Stone with Mound of Stone.

SEC. 3. Set a stone — × — × — ins., — ins. in the ground, for Standard Cor. to (e. g.) Secs. 35 & 36, marked S. C., with 1 notch on E and 5 notches on W. edges; from which Stone with Bearing Trees.

A —, — ins. diam. bears N — ° E. — lks. dist. marked T. 5 N. R. 3 W. S. 36, B. T.

A —, — ins. diam. bears N — ° W. — lks. dist. marked T. 5 N. R. 3 W. S. 35, B. T.

A —, — ins. diam. bears S — ° E. — lks. dist. marked T. 4 N. R. 3 W. S. 2, B. T.

SEC. 4. Set a post, 4 ft. long, 4 ins. square, with marked stone (charred stake or quart of charcoal) 12 ins. in the ground, for Standard Cor. to (e. g.) Secs. 35 & 36, marked Post in Mound.

S. C. T. 5 N. R. 3 W., on N.

S. 36, on E. and

S. 35 on W. faces, with 1 notch on E. and 5 notches on W. faces, dug pits, 18×18×12 ins., N., E. and W. of post, 5½ ft. dist. and raised a mound of earth 2 ft. high, 4½ ft. base round post.

SEC. 5. Set a post 4 ft. long, 4 ins. square, 24 ins. in the ground, for Standard Cor. to (e. g.) Secs. 35 & 36, marked Post with Bearing Trees.

S. C. T. 5 N. R. 3 W., on N.

S. 36, on E. and

S. 35 on W. faces, with 1 notch on E. and 5 notches on W. faces; from which

A —, — ins. diam. bears N — ° E. — lks. dist. marked T. 5 N. R. 3 W. S. 36, B. T.

A —, — ins. diam. bears N — ° W. — lks. dist. marked T. 5 N. R. 3 W. S. 35, B. T.

A —, — ins. diam. bears S — ° E. — lks. dist. marked T. 4 N. R. 3 W. S. 2, B. T.

SEC. 6. Deposited a marked stone (charred stake or quart of charcoal) 12 ins. in the ground, for Standard Cor. to (e. g.) Secs. 33 & 34, dug pits, 18×18×12 ins., N., E. and W. of corner, 5½ ft. dist., and raised a mound of earth 2 ft. high, 4½ ft. base over it. In E. pit drove a stake 2 ins. square, 2 ft. long, 12 ins. in the ground, marked Mound without Post or Stone.

T. 5 N. R. 3 W., S. C. on N.

S. 34 on E. and

S. 33 on W. faces, with 3 notches on E. & W. faces.

SEC. 7. A —, — ins. diam., which I marked (e. g.) Tree Corner without Bearing Trees.

S. C. T. 5 N. R. 3 W., on N.

S. 36 on E. and

S. 35 on W. faces, with 1 notch on E. and 5 notches on W. faces,

dug pits, 18×18×12 ins. N., E. & W. of tree, 5½ ft. dist. and raised a mound of earth around tree, for Standard Cor. to Secs. 35 & 36.

Tree Corner with Bearing Trees.

SEC. 8. A—, — ins. diam., which I marked (e. g.) S. C. T. 5 N. R. 3 W., on N.

S. 36, on E. and

S. 35 on W. faces, with 1 notch on E. and 5 notches on W. faces, for Standard Cor. to Secs. 35 & 36; from which

A—, — ins. diam. bears N —° E. — lks. dist. marked T. 5 N. R. 3 W. S. 36, B. T.

A—, — ins. diam. bears N —° W. — lks. dist. marked T. 5. N. R. 3 W. S. 35, B. T.

A —, — ins. diam. bears S —° E. — lks. dist. marked T. 4 N. R. 3 W. S. 2, B. T.

SECTION CLOSING CORNERS.

Stone with Pits and Mound.

SEC. 1. Set a—stone —×—×— ins.,—ins. in the ground, for Closing Cor. to (e. g.) Secs. 1 & 2, marked C. C., with 1 notch on E. and 5 notches on W. edges, dug pits, 18×18×12 ins. S., E. & W. of stone, 5½ feet dist., and raised a mound of earth 2 ft. high, 4½ ft. base alongside.

Stone with Mound of Stone.

SEC. 2. Set a — stone —×—×— ins., — ins. in the ground, for Closing Cor. to (e. g.) Secs. 3 & 4, marked C. C., with 3 notches on E. and W. edges, & raised, a mound of stone alongside. Pits impracticable.

Stone with Bearing Trees.

SEC. 3. Set a — stone —×—×— ins. — ins. in the ground, for Closing Cor. to (e. g.) Secs. 1 & 2, marked C. C., with 1 notch on E. and 5 notches on W. edges; from which

A —, — ins. diam. bears S —° E. — lks. dist. marked T. 4 N. R. 3 W. S. 1, B. T.

A —, — ins. diam. bears S —° W. — lks. dist. marked T. 4 N. R. 3 W. S. 2, B. T.

A —, — ins. diam. bears N —° E. — lks. dist. marked T. 5 N. R. 3 W. S. 36, B. T.

Post in Mound.

SEC. 4. Set a post 4 ft. long, 4 ins. square, with marked stone, (charred stake or quart of charcoal) 12 ins. in the ground for Closing Cor. to (e. g.) Secs. 1 & 2, marked

C. C. T. 4 N. R. 3 W., on S.

S. 1, on E. and

S. 2 on W. faces, with 1 notch on E. and 5 notches on W. faces, dug pits, 18×18×12 ins., S., E. & W. of post 5½ ft. dist., and raised a mound of earth 2 ft. high, 4½ ft. base around post.

Post with Bearing Trees.

SEC. 5. Set a post 4 ft. long, 4 ins. square, 24 ins. in the ground, for Closing Cor. to (e. g.) Secs. 1 & 2, marked

C. C. T. 4 N. R. 3 W., on S.

S. 1, on E. and

S. 2 on W. faces, with 1 notch on E. and 5 notches on W. faces; from which

A —, — ins. diam. bears S — ° E.— lks. dist. marked T. 4 N. R. 3 W. S. 1, B. T.

A —, — ins. diam. bears S — ° W.—lks. dist. marked T. 4 N. R. 3 W. S. 2, B. T.

A —, — ins. diam. bears N — ° E.— lks. dist. marked T. 5 N. R. 3 W. S. 36, B. T.

Mound without Post or Stone.

SEC. 6. Deposited a marked stone (charred stake or quart of charcoal) 12 ins. in the ground, for Closing Cor. to (e. g.) Secs. 3 & 4, dug pits, 18×18×12 ins., S., E. & W. of Cor., 5½

ft. dist., and raised a mound of earth 2 ft. high, 4½ ft. base over it. In E. pit drove a stake, 2 ins. square, 2 ft. long, 12 ins. in the ground, marked

C. C. T. 4 N. R. 3 W., on S.

S. 3, on E. and

S. 4 on W. faces, with 3 notches on E. & W. faces.

Tree Corner without Bearing Trees.

SEC. 7 A —, — ins. diam., which I marked (e. g.) C. C. T. 4 N. R. 3 W., on S.

S. 1, on E. and

S. 2 on W. faces, with 1 notch on E. and 5 notches on W. faces, dug pits 18×18×12 ins. S., E. & W. of tree, 5½ ft. dist., and raised a mound of earth around tree, for closing Cor. to Secs. 1 & 2.

Tree Corner with Bearing Trees.

SEC. 8. A —, —ins. diam., which I marked (e. g.) C. C. T. 4 N. R. 3 W., on S.

S. 1, on E. and

S. 2 on W. faces, with one notch on E. and 5 notches on W. faces, for Closing Cor. to Secs. 1 & 2; from which

A —, — ins. diam. bears S — ° E.— lks. dist. marked T. 4 N. R. 3 W. S. 1, B. T.

A —, — ins. diam. bears S — ° W.— lks. dist. marked T. 4 N. R. 3 W. S. 2, B. T.

A —, — ins. diam. bears N — ° E.— lks. dist. marked T. 5 N. R. 3 W. S. 36, B. T.

Connection Lines.

SEC. 9. All Section Closing Corners must be connected with the nearest corner on the Standard line.

CORNERS COMMON TO 4 TOWNSHIPS.

Stone with Pits and Mound.

SEC. 1. Set a — stone — × — × — ins., — ins. in the ground for Cor. to (e. g.) Tps. 2 & 3 N. R's 2 & 3 W., marked with 6 notches on each edge, dug pits, 24 × 18 × 12 ins. lengthwise on each line, N., S., E. & W. of stone, 6 ft. dist., and raised a mound of earth 2½ ft. high, 5 ft. base alongside.

Stone with Mound of Stone.

SEC. 2. Set a — stone — × — × — ins., — ins. in the ground, for Cor. to (e. g.) Tps. 2 & 3 N. R's 2 & 3 W. marked with 6 notches on each edge, and raised a mound of stone alongside. Pits impracticable.

Stone with Bearing Trees.

SEC. 3. Set a — stone — × — × — ins., — ins. in the ground, for Cor. to (e. g.) Tps. 2 & 3 N. R. 2 & 3 W. marked with 6 notches on each edge; from which

A —, — ins. diam. bears N — ° E.— lks. dist. marked T. 3 N. R. 2 W. S. 31, B. T.

A —, — ins. diam. bears S — ° E.— lks. dist. marked T. 2 N. R. 2 W. S. 6, B. T.

A —, — ins. diam. bears S — ° W.— lks. dist. marked T. 2 N. R. 3 W. S. 1, B. T.

A —, — ins. diam. bears N — ° W.— lks. dist. marked T. 3 N. R. 3 W. S. 36, B. T.

Post in Mound.

SEC. 4. Set a post, 4½ ft. long, 4 ins. square, with marked stone (charred stake or quart of charcoal) 12 ins. in the ground, for Cor. to (e. g.) Tps. 2 & 3 N. R's 2 & 3 W. marked

T. 3 N. S. 31, on N. E.

R. 2 W. S. 6, on S. E.

T. 2 N. S. 1, on S. W. and

R. 3 W. S. 36 on N. W. faces, with 6 notches on each edge, dug pits,

24 × 18 × 12 ins., lengthwise on each line, N., S., E. & W. of post, 6 ft. dist., and raised a mound of earth 2½ ft. high, 5 ft. base around post.

Post with Bearing Trees.

SEC. 5. Set a post 4½ ft. long, 4 ins. square, 24 ins. in the ground, for Cor. to (e. g.) Tps. 2 & 3 N. R's 2 & 3 W. marked

T. 3 N. S. 31, on N. E.
R. 2 W. S. 6, on S. E.
T. 2 N. S. 1, on S. W. and
R. 3 W. S. 36 on N. W. faces, with 6 notches on each edge; from which

A —, — ins. diam. bears N — ° E.— lks. dist. marked T. 3 N. R. 2 W. S. 31, B. T.

A —, — ins. diam. bears S — ° E.— lks. dist. marked T. 2 N. R. 2 W. S. 6, B. T.

A —, — ins. diam. bears S — ° W.— lks. dist. marked T. 2 N. R. 3 W. S. 1, B. T.

A —, — ins. diam. bears N — ° W.— lks. dist. marked T. 3 N. R. 3 W. S. 36, B. T.

Mound without Post or Stone.

SEC. 6. Deposited a marked stone (charred stake or quart of charcoal) 12 ins. in the ground for Cor. to (e. g.) Tps. 2 & 3 N. R's 2 & 3 W., dug pits, 24 × 18 × 12 ins., lengthwise on each line, N., S., E. & W. of cor., 6 ft. dist., and raised a mound of earth 2½ ft. high, 5 ft. base over it. In S. E. pit drove a stake 2 ins. square, 2 ft. long, 12 ins. in the ground, marked

T. 3 N. S. 31, on N. E.
R. 2 W. S. 6, on S. E.
T. 2 N. S. 1 on S. W. and
R. 3 W. S. 36, on N. W. faces, with 6 notches on each edge.

Tree Corner without Bearing Trees.

SEC. 7. A —, — ins. diam., which I marked (e. g.) T. 3 N. S. 31, on N. E.
R. 2 W. S. 6, on S. E.
T. 2 N. S. 1, on S. W. and
R. 3 W. S. 36 on N. W. faces, with 6 notches on each edge, dug pits, 24 × 18 × 12 ins. lengthwise on each line, N., S., E. & W. of tree, 6 ft. dist., and raised a mound of earth around tree, for Cor. to Tps. 2 & 3 N. R's 2 & 3 W.

Tree Corner with Bearing Trees.

SEC. 8. A —, — ins. diam., which I marked (e. g.) T. 3 N. S. 31, on N. E.
R. 2 W. S. 6, on S. E.
T. 2 N. S. 1, on S. W. and
R. 3 W. S. 36, on N. W. faces, with 6 notches on each edge, for Cor. to Tps. 2 & 3 N. R's 2 & 3 W. from which

A —, — ins. diam. bears N — ° E.— lks. dist. marked T. 3 N. R. 2 W. S. 31, B. T.

A —, — ins. diam. bears S — ° E.— lks. dist. marked T. 2 N. R. 2 W. S. 6, B. T.

A —, — ins. diam. bears S — ° W.— lks. dist. marked T. 2 N. R. 3 W. S. 1, B. T.

A —, — ins. diam. bears N — ° W.— lks. dist. marked T. 3 N. R. 3 W. S. 36, B. T.

CORNERS COMMON TO 4 SECTIONS.

Stone with Pits and Mound.

SEC. 1. Set a — stone — × — × — ins. — ins. in the ground for Cor. to (e. g.) Secs. 25, 26, 35 & 36, marked with 1 notch on S. & E. edges, dug pits, 18 × 18 × 12 ins. in each Sec., 5½ ft. dist., and raised a mound of earth 2 ft. high, 4½ ft. base alongside.

Stone with Mound Stone.

SEC 2. Set a — stone —×—×— ins. — ins. in the ground, for Cor. to (e. g.) Secs. 14, 15, 22 & 23, marked with 3 notches on S. and 2 notches on E. edges, and raised a mound of stone alongside. Pits impracticable.

Stone with Bearing Trees.

SEC. 3. Set a — stone —×—×— ins. — ins. in the ground, for Cor. to (e. g.) Secs. 9, 10, 15 & 16, marked with 4 notches on S. & 3 notches on E. edges, from which

A —, — ins. diam. bears N — °E.— lks. dist. marked T. 2 N. R. 2 W. S. 10, B. T.

A —, — ins. diam. bears S — °E.— lks. dist. marked T. 2 N. R. 2 W. S. 15, B. T.

A —, — ins. diam. bears S — °W.— lks. dist. marked T. 2 N. R. 2 W. S. 16, B. T.

A —, — ins. diam. bears N. — °W.— lks. dist. marked T. 2 N. R. 2 W. S. 9, B. T.

Post in Mound.

SEC. 4. Set a post 4 ft. long, 4 ins. square, with marked stone (charred stake or quart of charcoal) 12 ins. in the ground, for Cor. to (e. g.) Secs, 15, 16, 21 & 22, marked

T. 2 N. S. 15, on N. E.

R. 2 W. S. 22, on S. E.

S. 21, on S. W. and

S. 16 on N. W. faces, with 3 notches on S. & E. edges, dug pits, 18×18×12 ins. in each Sec., 5½ ft. dist., and raised a mound of earth 2 ft. high, 4½ ft. base around post.

Post with Bearing Trees.

SEC. 5. Set a post 4 ft. long, 4 ins. square, 24 ins. in the ground, for Cor. to (e. g.) Secs. 25, 26, 35 & 36, marked

T. 2 N. S. 25, on N. E.

R. 2 W. S. 36, on S. E.

S. 35, on S. W. and

S. 26, on N. W. faces, with 1 notch on S. & E. edges; from which

A —, — ins. diam. bears N — ° E.— lks. dist. marked T. 2 N. R. 2 W. S. 25, B. T.

A —, — ins. diam. bears S — ° E.— lks. dist. marked T. 2 N. R. 2 W. S. 36, B. T.

A —, — ins. diam. bears S — ° W.— lks. dist. marked T. 2 N. R. 2 W. S. 35, B. T.

A —, — ins. diam. bears N — ° W.— lks. dist. marked T. 2 N. R. 2 W. S. 26, B. T.

Mound without Post or Stone.

SEC. 6. Deposited a marked stone (charred stake or quart of charcoal) 12 ins. in the ground, for Cor. to (e. g.) Secs. 25, 26, 35 & 36, dug pits, 18×18×12 ins. in each Sec., 5½ ft. dist., and raised a mound of earth 2 ft. high, 4½ ft. base over it.

In S. E. pit drove a stake 2 ins. square, 2 ft. long, 12 ins in the ground, marked

T. 2 N. S. 25, on N. E.

R. 2 W. S. 36, on S. E.

S. 35, on S. W. and

S. 26 on N. W. faces, with 1 notch on S. & E. edges.

Tree Corner without Bearing Trees.

SEC. 7. A —, — ins. diam., which I marked (e. g.)

T. 2 N. S. 29, on N. E.

R. 2 W. S. 32, on S. E.

S. 31, on S. W. and

S. 30, on N. W. faces, with 1 notch on S. and 5 notches on E. edges, dug pits, 18×18×12 ins. in each sec. 5½ ft. dist. and raised a mound of earth around tree, for Cor. to Secs. 29, 30, 31 & 32.

Tree Corner without Bearing Trees.

SEC. 7. A —, — ins. diam., which I marked (e. g.) M. C. with
T. 2 N. on W.
R. 2 W. S. 13 on N. and
S. 24 on S. faces, for Meander Cor. to Fractional Secs. 13 & 24.

Tree Corner with Bearing Trees.

SEC. 8. A —, — ins. diam., which I marked (e. g.) M. C. with
T. 2 N. on E.
R. 2 W. S. 6 on N. and
S. 7 on S. faces, for Meander Cor. to Fractional Secs. 6 & 7; from which
A —, — ins. diam. bears N — ° W.— lks. dist. marked T. 2 N. R. 2 W. S. 6, M. C. B. T.
A —, — ins. diam. bears S — ° W.— lks. dist. marked T. 2 N. R. 2 W. S. 7, M. C. B. T.

Pits.

SEC. 9. When a pit is dug at a Meander Cor. it must be 8 lks. from the Cor., on the side opposite the river or lake meandered.

Marks.

SEC. 10. The letters "M. C." for Meander Corner must be marked on the side facing the river or lake meandered.

WITNESS CORNERS.

A Witness Corner must bear the same marks that would be placed upon the Corner for which it is a witness, with the addition of the letters W. C., and be established in all respects like such Corner.

If bearing trees are established for a Witness Corner, each tree must be marked W. C., in addition to the usual marks.

MISCELLANEOUS.

Rock in Place.

SEC. 1. When a rock in place is established for a Corner, its dimensions above ground must be given, and a cross (×) marked at exact Corner point. In other respects form for stone corners will be used.

Mounds of Earth.

SEC. 2. Where mounds of earth are raised "alongside" of Corners, on N. and S. lines, they must be placed on the W. and onE. and W. lines on the N. side of Corner. In case the character of the land is such that this cannot be done, the deputy will state in his notes instead of "alongside," "S" (or E.)

Mounds of Stone.

SEC. 3. In case where pits are practicable, the deputy prefers raising a mound of stone, or stone covered with earth, as more likely to perpetuate the Corner, he will use the form given for mound of stone, omitting the words "pits impracticable," and adding "covered with earth," when so established.

Bearing Trees.

SEC. 4. Where the requisite number of trees can be found within 300 links of the Corner point, three (3) bearing trees should be established for every Standard or Closing Cor., four (4) for every Cor. common to 4 Townships or Sections, and two (2) for every Quarter Sec. Cor. or Meander Cor. In case the requisite number cannot be found within limits, the deputy must state in his field notes after describing those established, "no other trees within limits," and "dug pits in Secs. — & —," or "raised a mound of stone alongside."

Stones.

SEC. 5. Stones 18 ins. and less long must be set two-thirds, and over 18 ins. long, three-fourths of their length in the ground. No stones containing less than 504 cubic inches must be used for corners.

Objects to be Noted.

SEC. 6. Particular attention is called to the "Summary of objects and data required to be noted," on pages — and — of these instructions, and it is expected that the deputy will thoroughly comply with same in his work and field notes.

Lines Discontinued at Legal Corners.

SEC. 7. No mountains, swampy lands, or lands not classed as surveyable are to be meandered, and all lines approaching such lands must be discontinued at the section or quarter section corner.

Fractional Townships.

SEC. 8. Where by reason of impassable objects the south boundary of a township cannot be established, an east and west line should be run through the Township, first random, then corrected, from one range line to the other, and as far south as possible, and from such line the section lines will be extended in the usual manner, except over any fraction south of said line, which may be surveyed in the opposite direction from the Section Corners on the auxiliary base thus established.

Boundaries.

SEC. 9. When no part of the east or west boundaries can be run, both the north and south boundaries will be established as true lines.

Convergency.

SEC. 10. Allowance for the convergency of Meridians must be made whenever necessary.

Red Chalk.

SEC. 11. All letters and figures cut in posts or trees must be marked over with red chalk to make them still more plain and durable.

Mode of Setting Corners.

SEC. 12. Township corners common to four townships, and section corners common to four sections, are to be set diagonally in the earth, with the angles in the direction of the lines. All other corners are to be set square, with the sides facing the direction of the lines.

Size of Posts, etc.

SEC. 13. The sizes of wooden posts, mounds, and pits noted in foregoing descriptions of corners are to be regarded as *minimum*, and whenever practicable to increase their dimensions it is desirable to do so.

Corner Materials.

SEC. 14. In establishing corners, stones should be used wherever practicable; then, posts; and lastly, mounds, with stake in pit.

Examine Instructions.

SEC. 15. It is expected that the deputy surveyors will carefully read and familiarize themselves with these instructions, and all others contained in this volume, and will instruct their assistants as to their duties before commencing work. Extra copies will be furnished the deputies for the use of their assistants.

MEANDERING.

SEC. 1. Proceeding *down* stream, the bank on the *left* hand is termed the "left bank," and that on the *right* hand the "right bank." These terms are to be universally used to distinguish the two banks of a river or stream.

SEC. 2. Both banks of *navigable* rivers are to be meandered by taking the general courses and distances of their sinuosities, and the same are to be entered in the field book.

At those points where either the township or section lines intersect the banks of a navigable stream, corners are to be established at the time of running these lines. These are called "meander corners"; and in meandering you are to commence at one of those corners, coursing the banks, and measuring the distance of each course from your com-

mencing corner to the next "meander corner." By the same method you are to meander the opposite bank of the same river.

The crossing distance *between* the MEANDER CORNERS on same line is to be ascertained by triangulation, in order that the river may be protracted with entire accuracy. The particulars to be given in the field notes.

Rivers not embraced in the class denominated "navigable" under the statute, but which are well-defined natural arteries of internal communication, will only be meandered *on one bank*. For the sake of uniformity, the surveyor will traverse the *right bank* when not impracticable; but where serious obstacles are met with, rendering it difficult to course along the right bank, he may cross to the left bank and continue the meanders as far as necessary; but all changes from one bank to the other will be made at the point of intersection of some line of the public surveys with the stream being meandered.

The subdividing deputies will be required to establish meander corners on both banks of such meanderable streams at the intersection of all section lines, and the distances across the river will be noted in the field book.

In meandering water-courses, where a distance is more than *ten chains* between stations, even chains only should be taken; but if the distance is *less* than ten chains, and it is found convenient to employ chains and links, the number of links should be a multiple of ten, thereby saving time and labor in testing the closings both in the field and in the surveyor-generals' office.

SEC. 3. You are also to meander, in manner aforesaid, all lakes, bayous, and deep ponds, which may serve as public highways of commerce. Shallow lakes or ponds, readily to be drained or likely to dry up, are not to be meandered. Lakes, bayous, and ponds lying entirely within a section are not to be meandered.

In meandering lakes, bayous, or ponds you are to commence at a meander corner, and proceed as above directed for meandering the banks of navigable streams; and from said corner take the courses and distances of the entire margin of the same, noting the intersections with all meander corners established thereon.

You will notice all streams of water falling into the river, lake, or bayou you are surveying, stating the width of the same at their mouth; also all springs, noting the size thereof and depth, and whether the water be pure or mineral; also the head and mouth of all bayous; and all islands, rapids, and bars are to be noticed, with intersections to their upper and lower points to establish their exact situation. You will also note the elevation of the banks of rivers and streams, the heights of falls and cascades, and the length of rapids.

SEC. 4. Meander lines should not be established at the segregation line between dry and swamp or overflowed land, but at the ordinary low-water mark of the actual margin of the rivers or lakes on which such swamp or overflowed lands border. In cases where such meander lines were formerly established at the segregation line between dry and swamp or overflowed lands, new and proper meander lines may be established under the direction of the surveyor general, and the township and section lines extended over such swamp or overflowed lands and the corners established, as hereinbefore provided, in order that the plats and field-notes of surveys may show the actual facts in the case.

5. The precise relative position of islands, in a township made fractional by the river in which the same are situated, is to be determined trigonometrically; sighting to a flag or other fixed object on the island,

from a special and carefully measured base line, connected with the surveyed lines, on or near the river bank, you are to form connection between the meander corners on the river to points corresponding thereto, in direct line, on the bank of the island, and there establish the proper meander corners, and calculate the distance across.

6. In taking the connection of an island with the main land, when there is no meander corner in line, opposite thereto, to sight from, you will measure a special base from the meander corner nearest to such island, and from such base you will triangulate to some fixed point on the shore of the island, ascertain the distance across, and there establish a *special* meander corner, wherefrom you will commence to meander the island.

7. The field-notes of meanders will be set forth in the field-books showing the dates when the work is performed, as illustrated in the specimen notes annexed. They are to state and describe particularly the meander corner from which they commenced, and each one upon which they close, and are to exhibit the meanders of each fractional section separately; following, and composing a part of such notes, will be given a description of the land, timber, depth of inundation to which the bottom is subject, and the banks, current, and bottom of the stream or body of water you are meandering. The utmost care must be taken to pass no object of topography, *or change therein*, without giving a particular description thereof in its proper place in your meander notes.

SURVEYING.

Initial points from which the lines of the public surveys are to be extended must be established whenever necessary under such special instructions as may be prescribed in each case by the Commissioner of the General Land Office. The locus of such initial points must be selected with great care and due consideration for their prominence and easy identification, and must be established astronomically.

The initial point having been established, the lines of the public surveys are to be extended therefrom as follows:

BASE LINE.

The base line shall be extended east and west from the initial point by the use of solar instruments or transits, as may be directed by the surveyor-general, in his special written instructions. Where solar instruments are used, the deputy must test said instruments in every 12 miles of line run, by taking the latitude, or by observation on the polar star; and in all cases where he has reason to suppose that said instrument is in error, he must take an observation on the polar star, and if error be found, must make the necessary corrections before proceeding with his survey. The proper corners shall be established at each 40 and 80 chains, and at the intersection of the line with rivers, lakes, or bayous that should be meandered, in accordance with the instructions for the establishment of corners. In order to check errors in measurement, two sets of chainmen, operating independently of each other, must be employed.

Where transits are used, the line will be run by setting off at the point of departure on the principal meridian, a tangent to the parallel of latitude, which will be a line falling at right angles to the said meridian. The survey will be continued on this line for twelve (12) miles, but the corners will be established at the proper points by offsets north-

erly from said line, at the end of each half mile. In order to offset correctly from the tangent to the parallel, the deputy will be guided by the table of offsets and azimuths contained in this volume. As the azimuth of the tangent is shown, the angle thence to the true meridian at each mile is readily found, thus indicating the direction of the offset line. The computations are made for a distance of 12 miles, at the end of which observations on the polar star must be taken for the projection of a new tangent. The computations are also upon even degrees of latitude; offsets for intervening parallels can be readily determined by interpolation. Where offset distances to quarter-section corners exceed 50 links, their direction to the parallel can be determined in like manner by interpolation for azimuth.

Where said distances are less than 50 links interpolations for determining directions will not be required.

PRINCIPAL MERIDIAN.

The principal meridian shall be extended north and south from the initial point, by the use of solar instruments or transits, as may be directed by the surveyor general in his special written instructions. Where solar instruments are used, the line will be run in the same manner as prescribed for running the base line by solar instruments. Where transits are used, observations upon the polar star must be taken within each 12 miles of line run. In addition to the above general instructions, it is required that in all cases where the establishment of a new principal meridian seems to be necessary to the surveyor-general, he shall submit the matter, together with his reasons therefor, to the Commissioner of the General Land Office, and the survey of such principal meridian shall not be commenced until written authority, together with such special instructions as he may deem necessary, shall have been received from the Commissioner.

STANDARD PARALLELS.

Standard parallels, which are also called correction lines, shall be extended east and west from the principal meridian, at intervals of every 24 miles north and south of the base line, in the same manner as prescribed for running the base line.

AUXILIARY MERIDIANS.

Auxiliary meridians shall be extended north and south from the base line, at intervals of every 24 miles east and west from the principal meridian, in the same manner as prescribed for running the principal meridian.

It is contemplated that these base, principal meridian, standard, and auxiliary meridian lines shall first be extended over the territory to be surveyed, and that afterwards township and section lines shall be run, where needed, within these tracts of 24 miles square, formed by the extension of these principal lines; and each surveyor general will therefore cause said principal lines to be extended as rapidly as practicable.

EXTERIORS OR TOWNSHIP LINES.

The east and west boundaries of townships are always to be run from south to north on a true meridian line; and the north and south bounda-

ries are to be run from east to west, or from west to east (according to the location of the township to be surveyed with reference to prior surveys), on a *random* or trial line and corrected back on a true line. The distance north or south of the township corner to be closed upon, from the point of intersection of these random lines with the east or west boundary of the township, must be carefully measured and noted. Should it happen, however, that such random line should fall short, or overrun in length, or intersect the east or west boundary more than *three chains'* distance from the township corner thereon, as compared with the corresponding boundary on the south (due allowance being made for convergency), the line, and if necessary the entire exterior boundaries of the township, must be retraced, so as to discover and correct the error. In running random lines temporary corners are to be set at each 40 and 80 chains, and permanent corners established upon the true line as corrected back, in accordance with instructions, throwing the excess or deficiency on the west half mile, as prescribed by law. Permanent corners are to be established in accordance with instructions on the east and west township boundaries at the time they are run. Whenever practicable the township lines within these tracts of 24 miles square must be surveyed in regular order from *south* to *north*, *i. e.*, the exterior boundaries of the township in any one range lying immediately north of the south boundary of such tract of 24 miles square must first be surveyed, and the exteriors of the other three townships in said range extended therefrom, in regular order from *south* to *north*, and it is preferable to first survey the entire range of townships in such tract adjoining the east boundary or adjoining the west boundary, and the other three ranges in regular sequence. In cases, however, where the character of the land is such that this rule cannot be complied with, the following will be observed. .

In extending the *south* or *north* boundaries of a township to the *west*, where the *southwest* or *northwest* corners cannot be established in the regular way by running a north and south line, such boundaries will be run *west on a true* line, allowing for convergency on the west half mile; and from the township corner established at the end of such boundary, the west boundary will be run *north* or *south*, as the case may be. In extending *south* or *north* boundaries of a township to the *east*, where the *southeast* or *northeast* corner cannot be established in the regular way, the same rule will be observed, except that such boundaries will be run *east on a true line*, and the *east* boundary run *north* or *south*, as the case may be. One set of chainmen only is required in running township lines.

METHOD OF SUBDIVIDING.

1. The first mile, both of the south and east boundaries of each township you are required to subdivide, is to be carefully traced and measured before you enter upon the subdivision thereof. This will enable you to observe any change that may have taken place in the magnetic variation, as it existed at the time of running the township lines, and will also enable you to compare your chaining with that upon the township lines.

2. Any discrepancy arising either from a change in the magnetic variation or a difference in measurement, is to be carefully noted in the field-notes.

3. After adjusting your compass to a variation which you have thus found will retrace the eastern boundary of the township, you will commence at the corner to sections 35 and 36, on the south boundary, and

run a line parallel to the range line, forty chains, to the quarter-section corner, which you are to establish between sections 35 and 36; continuing on said course forty chains farther, you will establish the corner to sections 25, 26, 35, and 36.

4. From the section corner last named run a *random* line, without blazing, *due east*, for the corner of sections 25 and 36, on east boundary, and at forty chains from the starting point set a post for *temporary* quarter-section corner. If you intersect exactly at the corner, you will blaze your random line back, and establish it as the *true* line; but if your random line intersects the said east boundary, either north or south of said corner, you will measure the distance of such intersection, from which you will calculate a course that will run a *true* line back to the corner from which your random started. You will establish the *permanent* quarter-section corner at a point equidistant from the two terminations of the *true* line.

5. From the corner of sections 25, 26, 35, and 36, run due north between sections 25 and 26, setting the quarter section post as before, at forty chains, and at eighty chains establishing the corner of sections 23, 24, 25, and 26. Then run a random *due east* for the corner of sections 24 and 25 on east boundary; setting temporary quarter-section post at forty chains; correcting back, and establishing *permanent* quarter-section corner at the equidistant point on the *true* line, in the manner directed on the line between sections 25 and 36.

6. In this manner you will proceed with the survey of each successive section in the first tier, until you arrive at the north boundary of the township, which you will reach in running up a random line between sections 1 and 2. If this random line should not intersect at the corner established for sections 1, 2, 35, and 36, upon the township line, you will note the distance that you fall east or west of the same, from which distance you will calculate a course that will run a true line south to the corner from which your random started. If the north boundary of a township is a base or standard line, the line between sections 1 and 2 is to be run north as a *true* line, and the closing corner established at the point of intersection with such base or standard line; and in such case the distance from said closing corner to the nearest section or quarter-section corner on such base or standard line must be carefully measured and noted as a *connection line.*

7. In like manner proceed with the survey of each successive tier of sections, until you arrive at the fifth tier; and from each section corner which you establish upon this tier you are to run random lines to the corresponding corners established upon the range line forming the western boundary of the township; setting, as you proceed, each *temporary* quarter-section corner at forty chains from the interior section corner, so as to throw the excess or deficiency of measurement on the extreme tier of quarter sections contiguous to the township boundary; and on returning establish the *true* line, and establish thereon the *permanent* quarter-section corner.

8. It is not required that the deputy shall complete the survey of the first tier of sections from south to north, before commenting the survey of the second or any subsequent tier, but the corner on which the random line closes must have been previously established by running the line north on which it is established, except as follows: Where it is impracticable to establish such section corner in the regular manner it may be established by running the east and west line *east* or *west*, as the case may be, *on a true line*, setting the quarter-section corner at 40 chains and the section corner at 80 chains.

9. Quarter-section corners, both upon north and south and upon east and west lines, are to be established at a point *equidistant* from the corresponding section corners, *except* upon the lines closing on the north and west boundaries of the township, and in those situations the quarter-section corners will always be established at precisely *forty chains* to the north or west (as the case may be) of the respective section corners from which those lines respectively *start*, by which procedure the excess or deficiency in the measurements will be thrown, according to law, on the extreme tier of quarter sections.

PRESCRIBED LIMITS FOR CLOSINGS AND LENGTH OF LINES IN CERTAIN CASES.

1. Every north-and-south section line, except those terminating in the north boundary of the township, must be *eighty chains* in length.

2. The east-and-west *section lines*, except those terminating in the west boundary of the township, are to be within *eighty links* of the actual distance established on the south boundary line of the township for the width of said tier of sections, and must close within eighty links north or south of the section corner.

3. The north boundary and south boundary of any one section, except in the extreme western tier, are to be within *eighty links* of equal length.

4. The meanders within each fractional section, or between any two meander posts, or of an island in the interior of a section, must close within one chain and fifty links.

5. In running *random* township exteriors, if such random lines fall short or overrun in length, or intersect the eastern or western boundary, as the case may be, of the township, at more than *three chains* north or south of the true corner, the lines must be *retraced*, even if found necessary to remeasure the meridional boundaries of the township. One set of chainmen, only, is required in subdividing.

SUBDIVISION OF SECTIONS.

Under the provisions of the act of Congress approved February 11, 1805, the course to be pursued in the subdivision of sections is to run straight lines from the established quarter-section corners—United States surveys—to the opposite corresponding corners, and the point of intersection of the lines so run will be the corner common to the several quarter-sections, or, in other words, the legal center of the section.

In the subdivision of fractional quarter sections where no opposite corresponding sections have been or can be fixed, the subdivision lines should be ascertained by running from the established corners due north, south, east, or west lines, as the case may be, to the water-course, Indian boundary line, or other external boundary of such fractional section.

The law presupposes the section lines surveyed and marked in the field by the United States deputy surveyors to be due north and south or east and west lines, but in actual experience this is not always the case; hence, in order to carry out the spirit of the law, it will be necessary, in running the subdivisional lines through fractional sections, to adopt mean courses where the section lines are not due lines, or to run the subdivision line parallel to the section line when there is no opposite section line.

Upon the lines closing on the north and west boundaries of a township, the quarter-section corners are established by the United States deputy surveyors at precisely forty chains to the north or west of the

last interior section corners, and the excess or deficiency in the measurement is thrown on the outer tier of lots, as per act of Congress approved May 10, 1800.

In the subdivision of quarter-sections the quarter-quarter corners are to be placed at points equidistant between the section and quarter-section corners and between the quarter corners and the common center of the section, *except* on the last half mile of the lines closing on the north or west boundaries of a township, where they should be placed at twenty chains, proportionate measurement, to the north or west of the quarter-section corner.

The subdivisional lines of fractional quarter sections should be run from points on the section lines intermediate between the section and quarter-section corners due north, south, east, or west, to the lake, watercourse, or reservation which renders such tracts fractional.

When there are double sets of section corners on township and range lines, the quarter corners for the sections south of the township lines and east of the range lines are not established in the field by the United States surveyors, but in subdividing such sections said quarter corners should be so placed as to suit the *calculations of the areas of the quarter-sections adjoining the township boundaries* as expressed upon the official plat, adopting proportionate measurements where the present measurements of the north or west boundaries of the sections differ from the original measurements.

RE-ESTABLISHMENT OF LOST CORNERS.

The original corners, when they can be found, must stand as the true corners they were intended to represent, even though not exactly where strict professional care might have placed them in the first instance.

Missing corners should be re-established in the identical localities they originally occupied. When the point cannot be determined by the existing landmarks in the field, resort must be had to the field notes of the original survey. The law provides that the lengths of the lines as stated in the field notes shall be considered as the true lengths thereof, and the distances between corners set down in the field notes constitute proper data from which to determine the true locality of a missing corner; hence the rule that all such should be restored at distances proportionate to the original measurements between existing original corners. That is, if the measurement between two existing corners differs from that stated in the field notes, the excess or deficiency should be distributed proportionately among the intervening section lines between the said existing corners standing in their original places. Missing corners on standard, township, and range lines should be restored by proportionate measurement between the nearest existing original corners on those lines. Missing section corners in the interior of townships should be re-established at proportionate distances between the nearest existing original corners *north* and *south* of the missing corners.

As has been observed, no existing original corner can be disturbed, and it will be plain than any excess or deficiency in measurements between existing corners cannot in any degree affect the distances beyond said existing corners, but must be added or subtracted proportionately to or from the intervals embraced between the corners which are still standing.

RETRACING TOWNSHIP LINES.

If, in subdividing a township, it is found that the exterior boundaries have been improperly run, measured, or marked, or the corners estab-

lished thereon have been obliterated, the deputy will resurvey so much of said exterior boundaries as may be necessary, and establish new corners upon same wherever necessary. Where no subdivisions have been made on either side of a township boundary, it will be corrected, if necessary, in point of alignment as well as measurement, by establishing the section corners at lawful distances from the south or east boundaries of the township (as the case may be), and upon a right line extending between the township corners; and in such case, the old corners on said township boundaries will be destroyed.

Where subdivisional lines have been closed upon a township boundary in advance of the preliminary survey of the same, its alignment will not be changed. If it is found necessary to establish new corners on such boundary they will receive only the marks referring to the sections in the township being subdivided, and the marks on the old corners on such boundary, which refer to such sections, will be obliterated.

In all cases such necessary corrections will be made as will place the section corners at the aforesaid lawful distances from the south or east boundary, in order that a legal subdivision of the township may be made, and where new corners are thus necessarily established, the distance, be it one hundred links or more, and direction between new and old corners must be carefully noted.

New corners on township boundaries must be established by a survey of such lines, and *in no case* will such corners be established from *data* acquired in running lines closing on such boundaries. One set of chainmen, only, is required in retracing township lines.

If, in the subdivision of part of a township, the lands to be surveyed cannot be reached by lines extending from the south boundary of the township, a line corresponding to the south boundary of the same shall be extended from some section corner on the east boundary of the township to the west boundary thereof, in order that it may constitute the south boundary of the surveyable area; from which subdivisional meridian lines will be projected northward, and the surveys carried forward in the same manner as for the subdivision of a full township, in order that regular and fractional areas shall occupy their true and legal positions.

Fragmentary portions of surveyable lands lying south of the provisional base last described may be included in the survey by extending lines *south* from the same in harmony with the general system.

When the proper point for the establishment of a section corner is inaccessible, and a witness monument can be erected upon each of the two lines which approach the same at distances not exceeding twenty chains therefrom, the quarter-sections depending thereon will be disposed of in the same manner as if the corner had been regularly established.

The witness monument must be marked as conspicuously as a section corner, and bearing trees used wherever possible.

The deputy will be required to furnish good evidence that the section corner is actually inaccessible.

When township or subdivision lines intersect the boundaries of confirmed private land claims, the latter must be retraced so far as may be necessary to establish the corners to the fractional sections at their proper places, and such corners must be established, in all respects, like meander corners, except that instead of the letters "M. C." the letters used to designate such private land claim must be marked on corners. In retracing the boundary of such claim the deputy must set stakes thereon, at each forty chains, where the ground is level, and on broken

ground, at every spur, ridge, or other prominent point, and also at each angle formed by a change in the direction of such boundary.

FIELD NOTES.

The deputy surveyor will provide himself with proper blank books for his field notes, or same will be furnished to him by the surveyor general, and in such books he must make a faithful, distinct, and minute record of everything officially done and observed by himself and his assistants, pursuant to instructions, in relation to running, measuring and marking lines, establishing corners, &c., and present, as far as possible, a full and complete topographical description of the country surveyed.

From the *data* thus recorded at the time when the work is done on the ground, the deputy must prepare *true* field notes of the surveys executed by him, in the manner hereinafter prescribed, and return same to the surveyor general, together with the required sketches, at the earliest practicable date after the completion of his work in the field.

The field notes of the survey of base, meridian, standard, exterior, and subdivision lines are each to be written in separate books.

The first, or title, page of the field-note book is to describe the subject-matter of the same, the locus of the survey, by whom surveyed, date of contract, and the dates of commencement and completion of the work. The second page is to contain the names and duties of the assistants, and the index is to be placed on same or following page. Whenever a new assistant is employed, or the duties of any one of them changed, such facts are to be stated in an appropriate entry immediately preceding the notes taken under such changed arrangements.

The exhibition of every mile of surveying, whether on township or subdivisional lines, and of meanders in each section, must be *complete in itself*, and be separated by a black line drawn across the paper.

The variation of the *needle* must always occupy a *separate line* preceding the notes of measurements on line.

The description of the surface, soil, minerals, timber, undergrowth, &c., on *each mile* of line, is to follow the notes of survey of such line, and not be mixed up with them.

The date of each day's work must follow immediately after the notes thereof.

No abbreviations of words are allowable, except of such words as are *constantly* occurring, such as "*sec.*" for "*section*"; "*in. diam.*" for "*inches diameter*"; "*chs.*" for "*chains*"; "*lks.*" for "*links*"; "*dist.*" for "*distant*"; "*¼ sec. cor.*" for "*quarter-section corner*"; "*va.*" for "*variation*," &c.; for 14 inches long, 12 inches wide, and 3 inches thick, in describing a corner stone, use 14 × 12 × 3, being particular to always observe the same order of length, width, and thickness. Proper names must never be abbreviated, however often their recurrence.

When the lines of survey cross hills or ravines, the height or depth of same, in feet, must be noted as nearly as practicable.

The corners established in previous surveys, from which the lines start, or upon which they close, must be fully described in the field notes. A full description of such corners will in all cases be furnished the deputy from the surveyor general's office at the date authority is given for commencing work.

In all cases where a corner is re-established the field notes must describe fully the manner in which it is done.

Field notes of the survey of base, standard, and meridian lines must describe all corners established thereon, how established, the crossings

of streams, ravines, hills, and mountains; character of soil, timber, minerals, &c.; and after the description of each township corner established in running such lines, the deputy will note particularly in the "general description" the townships on each side of the lines run.

Field notes of the survey of exterior boundaries of townships must describe the corners and topography, as above required, and the "general description" at the end of such notes must describe the townships as fully as may be, and also state whether or not they should be subdivided. The topography on the *true line* of exterior boundaries must be given, and not that on the random line.

Field notes of the subdivisional survey of townships must describe the corners and topography as above required, and the "general description" at the end of such notes must state minutely the character of the land, soil, timber, &c., found in such townships.

A blank line must be left at the bottom of each page of the field notes, and the notes must be written in a plain, legible hand, and in clear and precise language, so that the figures, letters, words, and meaning will always be unmistakable, and erasures and interlineations avoided, as far as possible.

With the notes of the survey of principal lines forming a tract of 24 miles square the deputy will submit a plat of the lines run, on a scale of one-half inch to the mile, and with the notes of survey of the exterior lines of townships, a plat of the lines run, on the scale of two inches to the mile, on which are to be noted all the objects of topography on line necessary to illustrate the notes, viz, the distance on line at the crossings of streams, so far as such can be noted on the paper, and the direction of each by an arrow head pointing down stream; also the intersection of line by prairies, marshes, swamps, ravines, ponds, lakes, hills, mountains, and all other matters indicated by the notes, to the fullest extent practicable.

With the instructions for making subdivisional surveys of townships into sections, the deputy will be furnished by the surveyor general with a diagram of the *exterior* lines previously established of the townships to be subdivided (on the above-named scale), upon which are carefully to be laid down the measurements of each of the lines on such boundaries whereon he is to close, and the magnetic variation of each mile. And on such diagram the deputy who subdivides will make appropriate sketches of the various objects of topography as they occur on his lines, so as to exhibit not only the points on line at which the same occur, but also the direction and position of each between the lines, or within each section, as far as practicable, so that every object of topography may be properly completed or connected in the showing.

SUMMARY OF OBJECTS AND DATA REQUIRED TO BE NOTED.

1. The precise length of every line run, noting all necessary offsets therefrom, with the reason and mode thereof.

2. The kind and diameter of all "*bearing trees*," with the course and distance of the same from their respective corners; and the precise relative position of WITNESS CORNERS to the *true corners*.

3. The kind of materials of which corners are constructed.

4. *Trees on line.* The name, diameter, and distance on line to all trees which it intersects.

5. Intersections by line of *land objects.* The distance at which the line first intersects and then leaves every *settler's claim and improvement;* prairie, river, creek, or other "bottom"; or swamp, marsh, grove, and

wind fall, with the course of the same at both points of intersection; also the distances at which you begin to ascend, arrive at the top, begin to descend, and reach the foot of all remarkable hills and ridges, with their courses, and *estimated* height, in feet, above the level land of the surrounding country, or above the bottom lands, ravines, or waters near which they are situated.

6. Intersections by line of *water objects.* All rivers, creeks, and smaller streams of water which the line crosses; the distances on line at the points of intersection, and their *widths on line.* In cases of *navigable* streams, their width will be ascertained between the *meander corners*, as set forth under the proper head.

7. The land's *surface*—whether level, rolling, broken, or hilly.

8. The *soil*—whether first, second, third, or fourth rate.

9. *Timber*—the several kinds of timber and undergrowth, in the order in which they predominate.

10. *Bottom lands*—to be described as wet or dry, and if subject to inundation, state to what depth.

11. *Springs of water*—whether fresh, saline, or mineral, with the course of the stream flowing from them.

12. *Lakes* and *ponds*—describing their banks and giving their height, and also depth of water, and whether it be pure or stagnant.

13. *Improvements.* Towns and villages; houses or cabins; fields, or other improvements; sugar-tree groves, sugar camps, mill seats, forges, and factories.

14. *Coal* banks or beds; *peat* or turf grounds; *minerals* and ores; with particular description of the same as to quality and extent, and all *diggings* therefor; also *salt* springs and licks. All reliable information you can obtain respecting these objects, whether they be on your immediate line or not, is to appear on the general description to be given at the end of the notes.

15. *Roads* and *trails*, with their directions, whence and whither.

16. Rapids, cataracts, cascades, or falls of water, with the estimated height of their fall in feet.

17. Precipices, caves, sink holes, ravines, stone quarries, ledges of rocks, with the kind of stone they afford.

18. *Natural curiosities*, interesting fossils, petrifications, organic remains, &c.; also all ancient works of art, such as mounds, fortifications, embankments, ditches, or objects of like nature.

19. The *variation* of the needle must be noted at all points or places on the lines where there is found any material *change* of variation, and the position of such points must be perfectly identified in the notes.

20. Besides the ordinary notes taken on line (and which must always be written down on the spot, leaving nothing to be supplied by memory), the deputy will subjoin, at the conclusion of his book, such further description or information touching any matter or thing connected with the township (or other survey) which he may be able to afford, and may deem useful or necessary to be known—with a *general description* of the township in the *aggregate*, as respects the face of the country, its soil and geological features, timber, minerals, waters, &c.

Following the "general description" of the township is to be "A list of the names of the individuals employed to assist in running, measuring, and marking the lines and corners described in the foregoing field notes of township No. ——— of the BASE LINE of range No. ——— of the ——— MERIDIAN, showing the respective capacities in which they acted."

AFFIDAVITS TO FIELD NOTES.

The following are the forms of official oaths to be taken by deputy surveyors and their assistants. The original oaths are to be affixed to the *true* field notes returned to the surveyor-general by the deputy surveyor; the preliminary oaths being placed immediately after the index of the first book, and the final oaths at the end of the last book of field notes of the surveys to which they refer:

PRELIMINARY OATHS OF ASSISTANTS.

I, ——— ———, do solemnly swear that I will well and truly perform the duties of compassman, according to instructions given me, and to the best of my skill and ability, in the survey of the ——— ———.

——— ———, *Compassman.*

Subscribed and sworn to before me this —— day of ———, 18—.

——— ———,
———.

We, ——— ——— and ——— ———, do solemnly swear that we will well and faithfully execute the duties of chain carriers; that we will level the chain upon even and uneven ground and plumb the tally pins, either by sticking or dropping the same; that we will report the true distance to all notable objects, and the true length of all lines that we assist in measuring, to the best of our skill and ability, and in accordance with instructions given us, in the survey of the ——— ———.

——— ———, *Chainman.*
——— ———, *Chainman.*
——— ———, *Chainman.*
——— ———, *Chainman.*

Subscribed and sworn to before me this —— day of ———, 18—.

——— ———,
———.

We, ——— ——— and ——— ———, do solemnly swear that we will well and truly perform the duties of axemen, in the establishment of corners and other duties, according to instructions given us, and to the best of our skill and ability, in the survey of ——— ———.

——— ———, *Axeman.*
——— ———, *Axeman.*

Subscribed and sworn to before me this —— day of ———, 18—.

——— ———,
———.

FINAL OATHS FOR SURVEYS.

List of names.

A list of the names of the individuals employed by ——— ———, United States deputy surveyor, to assist in running, measuring, and marking the lines and corners described in the foregoing field notes of the survey of ——— ———, showing the respective capacities in which they acted.

——— ———, *Compassman.*
——— ———, *Chainman.*
——— ———, *Chainman.*
——— ———, *Chainman.*
——— ———, *Chainman.*
——— ———, *Axeman.*
——— ———, *Axeman.*
——— ———, *Flagman.*

FINAL OATHS OF ASSISTANTS.

We hereby certify that we assisted ——— ———, United States deputy surveyor, in surveying all those parts or portions of the ——— of the ——— base and ——— meridian, ——— of ———, as are represented in the foregoing field notes as having been surveyed by him and under his direction; and that said survey has been in all respects, to the best of our knowledge and belief, well and faithfully surveyed, and

the corner monuments established according to the instructions furnished by the United States surveyor-general for ——.

—— ——, *Compassman.*
—— ——, *Chainman.*
—— ——, *Chainman.*
—— ——, *Chainman.*
—— ——, *Chainman.*
—— ——, *Axeman.*
—— ——, *Axeman.*
—— ——, *Flagman.*

Subscribed and sworn to before me this —— day of ——, 18—.

——— ———,
———.

FINAL OATH OF UNITED STATES DEPUTY SURVEYOR.

I, —— ——, United States deputy surveyor, do solemnly swear that in pursuance of instructions received from —— ——, United States surveyor general for ——, bearing date of the —— day of ——, 18—, I have well, faithfully, and truly, in my own proper person, and in strict conformity with the instructions furnished by the United States surveyor general for ——, the surveying manual, and the laws of the United States, surveyed all those parts or portions of —— —— of the —— base and —— meridian in the —— of ——, as are represented in the foregoing field notes as having been surveyed by me and under my directions; and I do further solemnly swear that all the corners of said survey have been established and perpetuated in strict accordance with the surveying manual, printed instructions, the special written instructions of the United States surveyor general for ——, and in the specific manner described in the field notes, and that the foregoing are the *true* field notes of such survey; and, should any fraud be detected, I will suffer the penalty of perjury, under the provisions of an act of Congress, approved August 8, 1846.

——— ———,
United States Deputy Surveyor.

Subscribed and sworn to before me this —— day of ——, 18—.

——— ———,
———.

The final oath of the deputy surveyor must, in all cases, be taken before some officer duly authorized to administer oaths. It is preferable that all oaths—both preliminary and final—of assistants should also be taken before such officer. In cases, however, where great delay or inconvenience would result from a strict compliance with this rule, the deputy surveyor is authorized to administer the necessary oaths to his assistants, but in each case where this is done he must submit a full written report to the proper surveyor general of the circumstances of such case.

To enable the deputy surveyor to fully understand and appreciate the responsibility under which he is acting, his attention is invited to the provisions of the second section of the act of Congress, approved August 8, 1846, entitled "An act to equalize the compensation of the surveyors-general of the public lands of the United States, and for other purposes," and which is as follows:

"SEC. 2. That the surveyors-general of the public lands of the United States, in addition to the oath now authorized by law to be administered to deputies on their appointment to office, shall require each of their deputies, on the return of his surveys, to take and subscribe an oath or affirmation that those surveys have been faithfully and correctly executed according to law and the instructions of the surveyor-general; and on satisfactory evidence being presented to any court of competent jurisdiction that such surveys, or any part thereof, had not been thus executed, the deputy making such false oath or affirmation shall be deemed guilty of perjury, and shall suffer all the pains and penalties attached to that offense; and the district attorney of the United States for the time being, in whose district any such false, erroneous, or fraudu-

lent surveys shall have been executed, shall, upon the application of the proper surveyor-general, immediately institute suit upon the bond of such deputy; and the institution of such suit shall act as a lien upon any property owned or held by such deputy, or his sureties, at the time such suit was instituted."

SPECIMEN FIELD NOTES AND PLATS.

Diagram A illustrates the method of laying off tracts of land 24 miles square, as nearly as practicable, by the survey of principal lines, and the survey of exteriors or township lines within such tracts, north of the base line and east of the principal meridian. The same general principles will apply equally to the survey of such tracts differently located with reference to the initial point. The topography noted on said diagram is on those portions of the lines of surveys for which specimen field notes are given.

Diagram B illustrates the method of laying off a township into sections and quarter sections. In the subdivision of townships lying *south* of and *contiguous* to the base line, or to any standard parallel, the lines between the northern tier of sections will be run north as *true* lines; quarter-section corners will be established at 40 chains, closing section corners will be established at the points of intersection of such lines with the base or standard lines (as the case may be), and the *course* and *distance* from such corners to the nearest corner upon the line closed upon are to be accurately ascertained and set down in the field notes.

Diagram C illustrates the mode of establishing stone, post, and mound corners for townships, sections, and quarter sections.

Specimen field notes Nos. 1, 2, 3, 4, and 5 illustrate, respectively, the mode and order of surveying standard lines, meridian lines, exteriors or township lines, resurveying exteriors or township lines, and subdividing a township into sections and quarter sections. The attention of the deputy is particularly directed to these specimens, as indicating not only the method in which his work is to be conducted, but also the order, manner, language, &c., in which his field notes are required to be returned to the surveyor general's office; and such specimens are to be deemed part of these instructions, and any *departure* from their details, without special authority, in cases where the circumstances are analogous in practice, *will be regarded as a violation of his contract and oath.*

The subdivisions of fractional sections into 40-acre lots (as near as may be) are to be so laid down on the official township plat in dotted black lines as to admit of giving to each a specific designation, if possible, according to its relative position in the fractional section, as per examples afforded by Diagram B, as well as by a number, in all cases where the lot cannot properly be designated as a quarter-quarter. Those fractional subdivision lots which are not susceptible of being described according to relative local position, are to be numbered in regular series; those bordering on the north boundary of a township to be numbered progressively from east to west, and those bordering on the west boundary of a township to be numbered progressively from north to south, in each section. As section 6 borders on both the north and west boundaries of the township, the fractional lots in same will be numbered as follows: Commencing with No. 1 in the northeast, thence progressively west to No. 4 in the northwest, and south to No. 7 in the southwest corner of the section.

In numbering fractional lots, other than those above specified (wherever practicable and as a general rule), the series should commence with

north end then begins a retrograde motion towards the west, and at about one o'clock in the afternoon reaches the point at which it is said to be at its western elongation, after which it again turns back towards the east.

The times at which the needle reaches its eastern and western elongations vary with the seasons of the year (with the sun's declination), happening a little earlier in summer than in winter.

The angular range between the eastern and western elongations varies also with the seasons of the year.

The average position of the needle for the day is called the *mean magnetic meridian.*

At about six o'clock in the evening (and for about an hour before and after), throughout the year, the position of the needle coincides very nearly with the mean magnetic meridian, and this, therefore, is the time most favorable for making observations to obtain at once the mean declination.

For reducing the direction of the needle observed at other hours to the mean magnetic meridian the following table is furnished. It gives to the nearest minute the variations of the needle from its average position during the day, for each hour in the day for the four seasons of the year.

Table for reducing the observed declination to the mean declination of the day.

	The needle points east of the mean magnetic meridian.					The needle points west of the mean magnetic meridian.							
	A. M.	A. M.	A. M.	A. M.	A. M.	A. M.	Noon.	P. M.	P. M.	P. M.	P. M.	P. M.	P. M.
Hour	h. 6	h. 7	h. 8	h. 9	h. 10	h. 11	Noon.	h. 1	h. 2	h. 3	h. 4	h. 5	h. 6
	′	′	′	′	′	′	′	′	′	′	′	′	′
Spring	3	4	4	3	1	1	4	5	5	4	3	2	1
Summer	4	5	5	4	1	2	4	6	5	4	3	2	1
Autumn	2	3	3	2	0	2	3	4	3	2	1	1	0
Winter	1	1	2	2	1	0	2	3	3	2	1	1	0

The secular variation of the magnetic declination is a subject of the greatest importance to surveyors. It manifests itself by a gradual change in one direction, which at first increases slowly, then more rapidly, diminishing again afterward until the needle becomes stationary and subsequently returns by similar changes to its former position, the whole period extending over nearly two and a half centuries. Thus it will be seen by a table given below that at Philadelphia the declination was $8\frac{3}{4}^{\circ}$ west in 1700, whence it diminished until in 1800 it reached a minimum 2°.1 (2° 6′), and will increase again to 6°.8 in 1880. At present all along the Atlantic and Gulf coasts the effect of the secular variation is to *increase* west declinations or to *decrease* east declinations by from 2′ to 5′, but on the Pacific coast the effect is opposite in direction, viz, *increasing* east declinations by from 1′ to 3′.

In Alaska, however, we have indications of a decrease of east declinations.

The following table of computed declinations at various places, taken from the Coast Survey Report for 1874, exhibits the effect of the secular variation for a number of places, and will be found especially useful where old lines have to be retraced.

The table should not be extended in time either way without the support of additional observations.

TABLE OF DECIMAL VALUES OF THE MAGNETIC DECLINATION.

[From the Coast Survey Report of 1874, Appendix No. 8, with improvements.]

This table has been constructed to facilitate the reduction of observed declinations from one epoch to another; it will be found specially useful when old lines run by compass have to be retraced, and for the construction of isogonic charts for a given epoch. A + sign indicates west; a − sign, east declination.

Year (Jan. 1).	Halifax, Nova Scotia.	Quebec, Canada.	York Factory, Hudson Bay.	Portland, Me.	Burlington, Vt.	Rutland, Vt.	Portsmouth, N. H.	Newburyport, Mass.	Salem, Mass.	Boston, Mass.	Cambridge, Mass.	Nantucket, Mass.	Providence, R. I.	Hartford, Conn.	New Haven, Conn.	Albany, N. Y.	Oxford, N. Y.	Buffalo, N. Y.	Erie, Pa.	Cleveland, Ohio.	Detroit, Mich.
	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
1640	.....	+15.9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
50	.....	16.4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
60	.....	16.5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
70	.....	16.4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
80	.....	15.9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
90	.....	+15.2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1700	.....	.....	.....	.....	.....	.....	.....	.....	.....	+10.0	+ 9.8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
10	.....	.....	.....	.....	.....	.....	.....	.....	.....	9.3	9.2	.....	+10.4	.....	.....	.....	.....	.....	.....	.....	.....
20	.....	.....	+18.6	.....	.....	.....	.....	.....	.....	8.7	8.7	.....	9.5	.....	.....	.....	.....	.....	.....	.....	.....
30	.....	.....	19.2	.....	.....	.....	.....	.....	.....	8.1	8.3	.....	8.9	.....	.....	.....	.....	.....	.....	.....	.....
40	.....	.....	18.8	.....	.....	.....	.....	.....	.....	7.6	7.9	.....	8.4	.....	.....	.....	.....	.....	.....	.....	.....
50	+12.5	.....	17.2	.....	.....	.....	.....	.....	.....	7.2	7.5	.....	7.7	.....	.....	.....	.....	.....	.....	.....	.....
60	13.0	.....	14.8	+ 8.1	.....	.....	.....	.....	.....	6.8	7.2	.....	6.9	.....	+6.1	.....	.....	.....	.....	.....	.....
70	13.7	.....	11.6	8.1	.....	.....	+ 7.8	+ 7.0	.....	6.7	7.0	+ 6.5	6.3	.....	5.5	.....	.....	.....	.....	.....	.....
80	14.4	.....	7.9	8.2	.....	+ 7.0	7.7	7.0	+ 6.4	6.6	6.9	6.5	6.12	+5.4	5.1	.....	.....	.....	+0.46	.....	.....
90	15.1	.....	4.0	8.5	+ 7.7	6.5	7.8	7.2	6.2	6.7	6.9	6.7	6.24	5.2	4.8	.....	+3.01	+0.14	−0.03	−2.2	.....
1800	15.9	.....	+ 0.1	8.9	7.52	6.2	8.0	7.4	6.2	7.0	7.1	7.0	6.37	5.16	4.7	.....	2.96	−0.01	−0.35	−2.0	−3.18
10	16.7	+11.2	− 3.3	9.4	7.39	6.14	8.4	7.8	6.5	7.4	7.5	7.4	6.45	5.24	4.8	+5.4	3.10	+0.05	−0.49	−1.8	−3.11
20	17.4	12.3	− 6.1	10.0	7.58	6.39	8.8	8.4	7.0	7.9	8.0	7.84	6.73	5.46	5.0	5.79	3.40	0.30	−0.43	−1.5	−2.90
30	18.1	13.4	− 8.1	10.6	8.17	6.90	9.35	9.0	7.8	8.43	8.64	8.38	7.43	5.80	5.43	6.32	3.87	0.74	−0.17	−1.05	−2.55
40	18.7	14.4	− 9.0	11.23	8.94	7.64	9.94	9.6	8.7	9.05	9.33	8.95	8.31	6.24	5.99	6.97	4.46	1.33	+0.25	−0.60	−2.09
50	19.3	15.3	− 8.8	11.82	9.62	8.53	10.55	10.23	9.8	9.69	10.03	9.53	9.09	6.77	6.67	7.70	5.14	2.05	+0.83	−0.14	−1.56
60	19.8	16.0	− 7.5	12.35	10.21	9.53	11.15	10.83	10.9	10.32	10.67	10.06	9.65	7.36	7.41	8.47	5.89	2.85	+1.50	+0.31	−0.99
70	20.1	+16.4	− 5.3	12.80	10.97	10.54	11.7	11.4	11.9	10.90	11.21	10.54	10.21	7.99	8.18	9.2	6.65	3.68	+2.23	+0.72	−0.41
80	+20.3	.....	.....	+13.13	+11.97	+11.49	+12.2	+11.8	+12.8	+11.41	+11.63	+10.93	+10.94	+8.62	+8.9	+9.9	+7.38	+4.49	+2.96	+1.07	+0.13

TABLE OF DECIMAL VALUES OF THE MAGNETIC DECLINATION—Continued.

Year (Jan. 1).	New York, N. Y.	Hatborough, Pa.	Philadelphia, Pa.	Washington, D. C.	Cape Henry, Va.	Charleston, S. C.	Savannah, Ga.	Key West, Fla.	Havana, Cuba.	Kingston, Jamaica.	New Orleans, La.	Vera Cruz, Mexico.	Mexico, Mexico.	Acapulco, Mexico.	Panama, New Granada.	San Blas, Mexico.	San Diego, Cal.	Monterey, Cal.	San Francisco, Cal.	Cape Disappointment, Wash.	Sitka, Alaska.	Unalaska Island.
	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	
1640	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
60	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
70	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
80	+8.8	+8.5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
90	8.8	8.3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1700	8.5	7.9	+8.7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
10	8.0	7.5	8.3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
20	7.6	7.0	7.8	.....	+4.44	.....	.....	.....	−4.2	.....	−3.4	−1.67	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
30	7.2	6.3	7.0	.....	+3.95	.....	.....	.....	4.5	−6.2	3.7	−2.62	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
40	6.6	5.6	6.2	.....	+3.37	−3.1	.....	.....	−4.8	−6.4	4.1	.....	.....	−2.9	.....	.....	.....	.....	.....	.....	.....	.....
50	5.9	4.7	5.3	.....	.....	4.1	.....	.....	.....	.....	4.7	.....	.....	3.8	.....	.....	.....	.....	.....	.....	.....	.....
60	5.2	3.8	4.4	.....	.....	4.6	.....	.....	.....	.....	5.3	−5.75	−4.7	4.7	.....	.....	.....	.....	.....	.....	.....	.....
70	4.6	2.9	3.6	.....	.....	4.9	.....	.....	.....	.....	5.9	6.74	5.5	5.6	−7.87	.....	.....	.....	.....	.....	.....	.....
80	4.4	2.2	2.9	.....	.....	5.1	.....	.....	.....	.....	6.5	7.63	6.4	6.4	7.88	.....	.....	.....	.....	.....	.....	.....
90	4.29	1.8	2.4	−0.07	.....	5.1	.....	.....	.....	−6.3	7.0	8.37	7.1	7.2	7.84	−7.41	−11.0	−11.4	−12.8	−18.0	.....	−18.92
1800	4.28	1.8	2.1	+0.02	+0.22	4.9	.....	.....	−6.2	−6.0	7.5	8.95	7.7	7.8	7.74	7.88	11.1	12.0	13.4	18.1	−26.16	19.23
10	4.30	2.03	2.1	+0.23	+0.09	4.5	−4.9	.....	−6.26	−5.7	7.9	9.32	8.3	8.3	7.60	8.28	11.3	12.6	13.9	18.4	27.05	19.50
20	4.47	2.53	2.28	+0.55	+0.13	4.04	4.8	−6.9	−6.22	−5.4	8.1	9.48	8.6	8.68	7.42	8.61	11.6	13.3	14.42	18.7	27.85	19.70
30	4.91	3.17	2.71	+0.96	+0.34	3.44	4.5	−6.52	−6.12	−5.0	8.2	9.42	8.8	8.88	7.20	8.84	11.9	13.9	14.92	19.2	28.49	19.82
40	5.59	3.86	3.33	+1.45	+0.70	2.78	4.14	−6.03	−5.94	−4.6	8.14	9.14	8.9	8.91	6.95	8.97	12.20	14.44	15.38	19.72	28.92	19.86
50	6.34	4.57	4.11	+1.95	+1.19	2.12	3.65	−5.47	−5.71	−4.2	7.94	8.66	8.76	8.79	6.67	9.00	12.54	14.95	15.78	20.29	29.11	19.81
60	6.96	5.29	4.99	+2.47	+1.77	1.52	3.08	−4.86	−5.44	−3.8	7.61	7.98	8.48	8.50	6.38	−8.91	12.88	15.42	16.11	20.88	29.05	19.68
70	7.43	6.0	5.89	+2.97	+2.40	1.00	2.48	−4.24	−5.1	−3.4	7.15	−7.15	8.04	8.06	6.08	.....	13.20	15.79	16.36	21.46	28.74	19.48
80	+7.84	+6.8	+6.76	+3.41	+3.05	−0.62	−1.89	−3.65	.....	.....	−6.62	.....	−7.46	−7.5	−5.79	.....	−13.50	−16.08	−16.52	−22.00	−28.20	−19.21

It will be observed that the amount of change is by no means the same even in places not far remote from each other, as New York and Philadelphia.

In grouping together a table of the present rate of change much allowance must therefore be made for possible local peculiarities that have not been ascertained.

The following statement of the present (1878) annual change in the magnetic declination, due to the secular variation, may serve to give a general idea of the *approximate* amount of change along our immediate sea-coast. For the interior States the information is very scanty, and therefore less trustworthy, or altogether wanting.

The annual change is expressed in minutes of arc, a + sign indicating increase of westerly or decrease of easterly declination.

Locality.	Annual change.
Maine, coast of	+2
Maine, interior	+3
New Hampshire	+3½
Vermont	+5½
Massachusetts, eastern part	+2½
Massachusetts, western part	+3 to 4
Rhode Island and Connecticut	+3¼
New York, Long Island	+3
New York, northern and western part	+4⅛
New Jersey	+3
Pennsylvania	+3½
Ohio	+2½
Tennessee, eastern part	+2¼
Tennessee, western part	+2
Missouri	+2
Delaware, Maryland, and Virginia	+3
West Virginia	+3½
North Carolina, South Carolina, and Georgia	+3¼
Florida, northern part	+3¼
Florida, southern part	+2
Alabama and Mississippi, Gulf coast of	+3
Louisiana, eastern part	+2½
Louisiana, western coast	+2
Texas, coast of	+1
Texas, southwestern part	0 (probably.)
New Mexico and Southwestern Arizona	−1½
California, coast of	−2 to 2½
Oregon, coast of	−2½ to 3
Washington Territory, coast of	

The negative sign indicates an increase of easterly direction.

METHOD OF ASCERTAINING THE TRUE MERIDIAN AND THEREBY THE MAGNETIC DECLINATION OR VARIATION OF THE COMPASS.

The following chapter, on the subject of the declination of the magnetic needle, is extracted from the revised edition of the work on surveying by Dr. Charles Davies, a graduate of the Military Academy at West Point. The work itself will be a valuable acquisition to the deputy surveyor, and his attention is particularly invited to the following chapter, which sets forth the usual easy modes by which the true meridian and magnetic declination may be approximately ascertained; his attention is also called to more complete statements on the subject given in the work "A treatise on land-surveying, &c.," by Dr. W. M. Gillespie, professor of engineering, Union College, in chapter treating of the declination of the magnetic needle. For more refined methods, he may consult Coast Survey Report for 1875, Appendix No. 16.

METHOD OF ASCERTAINING THE TRUE MERIDIAN.

The best practical method of determining the true meridian of a place is by observing the north star. If this star were precisely at the point in which the axis of the earth, prolonged, pierces the heavens, then the intersection of the vertical plane passing through it and the place, with the surface of the earth, would be the true meridian. But the star being at a distance from the pole equal to 1° 30′ nearly, it performs a revolution about the pole in a circle, the polar distance of which is 1° 30′; the time of revolution is 23 hours and 56 minutes.

To the eye of an observer this star is continually in motion, and is due north but twice in 23 hours and 56 minutes; and is then said to be on the meridian. Now, when it departs from the meridian, it apparently moves east or west for 5 hours and 59 minutes, and then returns to the meridian again.

When at its greatest distance from the meridian, east or west, it is said to be at its *eastern* or *western* elongation.

The following tables show the times of its eastern and western elongations:

Time of elongation of Polaris (a Ursæ Min.), April 1, 1883, *to April* 1, 1884, *computed for north latitude* 38°, *and which will serve for all latitudes from* 26° *to* 50° *north, and for all dates from April,* 1878, *to April,* 1888, *with an error of less than five minutes.*

[The times are reckoned from noon (astronomical time).]

EASTERN ELONGATIONS.

Day.	April.	May.	June.	July.	August.	September.
	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.
1	18 37	16 39	14 37	12 39	10 37	8 36
7	18 14	16 16	14 14	12 16	10 14	8 12
13	17 50	15 52	13 50	11 52	9 50	7 48
19	17 26	15 28	13 26	11 29	9 27	7 25
25	17 03	15 05	13 03	11 05	9 03	7 01

WESTERN ELONGATIONS.

Day.	October.	November.	December.	January.	February.	March.
	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.
1	18 27	16 25	14 28	12 26	10 24	8 30
7	18 04	16 02	14 04	12 02	10 00	8 06
13	17 40	15 38	13 40	11 39	9 37	7 43
19	17 17	15 15	13 17	11 15	9 13	7 19
25	16 53	14 51	12 53	10 51	8 49	6 55

The eastern elongations are put down from the beginning of April to the end of September, and the western from the beginning of October to the end of March. The time is computed from noon. The western elongations in the first case, and the eastern in the second, occurring in the day-time, cannot be used. Some of those put down are also invisible, occurring in the evening before it is dark, or after daylight in the morning.

In such case, if it be necessary to determine the meridian at that particular season of the year, let 5 hours 59 minutes be added to or subtracted from the time of greatest eastern or western elongation, and the observation be made at night when the star is on the meridian.

The following table exhibits the angle which the meridian plane makes with the vertical plane passing through the pole-star when at its greatest eastern or western elongation; such angle is called the *azimuth*.

The mean angle only is put down, being calculated for the first of July of each year.

Azimuth of Polaris (a Ursæ Min.) at elongation, 1878 *to* 1888.

(Latitude 26° to 50° north.)

	26°	28°	30°	32°	34°	36°	38°	40°	42°	44°	46°	48°	50°
	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
1878	1 29½	1 31¼	1 33	1 35	1 37½	1 39½	1 42¼	1 45½	1 48½	1 52	1 56	2 00½	2 05½
1879	29¾	30¾	32¾	34½	36¾	39½	41¾	44¾	48	51½	55½	2 00	04½
1880	29	30½	32¼	34¼	36½	38¾	41½	44¼	47½	51	55	1 59½	04½
1881	28½	30¼	32	33¾	36	38½	41	44	47	50¾	54½	59	03¾
1882	28¼	29¾	31½	33½	35¾	38	40½	43⅜	46⅜	50¼	54¼	58⅓	03¼
1883	28	29½	31¼	33	35¼	37½	40¼	43	46¼	49¾	53¾	58	02¾
1884	27½	29	30¾	32¾	35	37½	39¾	42⅜	45⅝	49¼	53½	57⅔	02¼
1885	27¼	28¾	30½	32¼	34½	36¾	39½	42¼	45½	49	52¾	57	02
1886	26¾	28¼	30	32	34	36½	39	41¾	45	48½	52¼	56½	01½
1887	26½	28	29¾	31½	33¾	36	38½	41½	44½	48	51¾	56½	01
1888	26	27¾	29¼	31¼	33¼	35¾	38¼	41	44	47½	51¼	55¾	00½

TO FIND THE TRUE MERIDIAN WITH THE THEODOLITE.

Take a board, of about one foot square, paste white paper upon it, and perforate it through the center; the diameter of the hole being somewhat larger than the diameter of the telescope of the theodolite. Let this board be so fixed to a vertical staff as to slide up and down freely; and let a small piece of board, about three inches square, be nailed to the lower edge of it, for the purpose of holding a candle.

About twenty-five minutes before the time of the greatest eastern or western elongation of the pole-star, as shown by the tables of elongations, let the theodolite be placed at a convenient point and leveled. Let the board be placed about one foot in front of the theodolite, a lamp or candle placed on the shelf at its lower edge; and let the board be slipped up or down, until the pole-star can be seen through the hole. The light reflected from the paper will show the cross hairs in the telescope of the theodolite.

Then, let the vertical spider's line be brought exactly upon the pole-star, and if it is an eastern elongation that is to be observed, and the star has not yet reached the most easterly point, it will move from the line toward the east, and the reverse when the elongation is west.

At the time the star attains its greatest elongation, it will appear to coincide with the vertical spider's line for some time, and then leave it, in the direction contrary to its former motion.

As the star moves toward the point of greatest elongation, the telescope must be continually directed to it, by means of the tangent screw of the vernier plate; and when the star has attained its greatest elongation, great care should be taken that the instrument be not afterward moved.

Now, if it be not convenient to leave the instrument in its place until daylight, let a staff, with a candle or small lamp upon its upper extremity, be arranged at thirty or forty yards from the theodolite, and in the

same vertical plane with the axis of the telescope. This is easily effected, by revolving the vertical limb about its horizontal axis without moving the vernier plate, and aligning the staff to coincide with the vertical hair. Then mark the point directly under the theodolite; the line passing through this point and the staff, makes an angle with the true meridian equal to the azimuth of the pole star.

From the table of azimuths, take the azimuth corresponding to the year and nearest latitude. If the observed elongation was east, the true meridian lies on the west of the line which has been found, and makes with it an angle equal to the azimuth. If the elongation was west, the true meridian lies on the east of the line; and, in either case, laying off the azimuth angle with the theodolite, gives the true meridian.

TO FIND THE TRUE MERIDIAN WITH THE COMPASS.

1. Drive two posts firmly into the ground, in a line nearly east and west; the uppermost ends, after the posts are driven, being about three feet above the surface, and the posts about four feet apart; then lay a plank, or piece of timber three or four inches in width, and smooth on the upper side, upon the posts, and let it be pinned or nailed, to hold it firmly.

2. Prepare a piece of board four or five inches square, and smooth on the under side. Let one of the compass sights be placed at right angles to the upper surface of the board, and let a nail be driven through the board, so that it can be tacked to the timber resting on the posts.

3. At about twelve feet from the stakes, and in the direction of the pole star, let a plumb be suspended from the top of an inclined stake or pole. The top of the pole should be of such a height that the pole star will appear about six inches below it; and the plumb should be swung in a vessel of water to prevent it from vibrating.

This being done, about twenty minutes before the time of elongation place the board to which the compass sight is fastened on the horizontal plank, and slide it east or west until the aperture of the compass sight, the plumb line, and the star are brought into the same range. Then if the star depart from the plumb line move the compass sight east or west along the timber, as the case may be, until the star shall attain its greatest elongation, when it will continue behind the plumb line for several minutes, and will then recede from it in the direction contrary to its motion before it became stationary. Let the compass sight be now fastened to the horizontal plank. During this observation it will be necessary to have the plumb line lighted; this may be done by an assistant holding a candle near it.

Let now a staff, with a candle or lamp upon it, be placed at a distance of thirty or forty yards from the plumb line, and in the same direction with it and the compass sight. The line so determined makes, with the true meridian, an angle equal to the azimuth of the pole star; and from this line the variation of the needle is readily determined, even without tracing the true meridian on the ground.

Place the compass upon this line, turn the sights in the direction of it, and note the angle shown by the needle. Now, if the elongation at the time of observation was west, and the north end of the needle is on the west side of the line, the azimuth, plus the angle shown by the needle, is the true variation. But should the north end of the needle be found on the east side of the line, the elongation being west, the difference between the azimuth and the angle would show the variation, and the reverse when the elongation is east.

1. Elongation west, azimuth	2° 04′	
North end of the needle on the west, angle	4° 06′	
Variation	6° 10′	west.
2. Elongation west, azimuth	1° 59′	
North end of the needle on the east, angle	4° 50′	
Variation	2° 51′	east.
3. Elongation east, azimuth	2° 05′	
North end of the needle on the west, angle	8° 30′	
Variation	6° 25′	west.
4. Elongation east, azimuth	1° 57′	
North end of the needle on the east, angle	8° 40′	
Variation	10° 37′	east.

The variation at West Point in September, 1835, was 6° 32′ west.

The variation of the needle should always be noted on every survey made with the compass, and then if the land be surveyed at a future time the old lines can always be rerun.

It has been found by observation that heat and cold sensibly affect the magnetic needle, and that the same needle will at the same place indicate different lines at different hours of the day.

If the magnetic meridian be observed early in the morning, and again at different hours of the day, it will be found that the needle will continue to recede from the meridian as the day advances, until about the time of the highest temperature, when it will begin to return, and at evening will make the same line as in the morning. This change is called the *diurnal variation*, and varies, during the summer season, from one-fourth to one-fifth of a degree.

A very near approximation to a true meridian, and consequently to the variation, may be had, by remembering that the pole star very nearly reaches the true meridian when it is in the same vertical plane with the star Alioth in the tail of the Great Bear, which lies nearest the four stars forming the quadrilateral.

The vertical position can be ascertained by means of a plumb line. To see the spider's lines in the field of the telescope at the same time with the star, a faint light should be placed near the object glass. When the plumb line, the star Alioth, and the north star fall on the vertical spider's line, the horizontal limb is firmly clamped and the telescope brought down to the horizon; a light, seen through a small aperture in a board, and held at some distance by an assistant, is then moved according to signals, until it is covered by the intersection of the spider's lines. A picket driven into the ground, under the light, serves to mark the meridian line for reference by day, when the angle formed by it and the magnetic meridian may be measured.

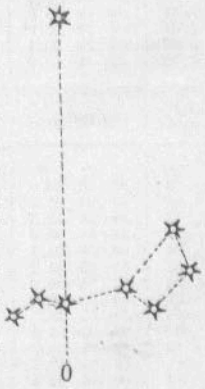


Table showing the difference of latitude and departure in running 80 chains at any course from 1 to 60 minutes.

Minutes.	Links.	Minutes.	Links.	Minutes.	Links.
1	2 1/3	21	49	41	95 2/3
2	4 2/3	22	51 1/3	42	98
3	7	23	53 2/3	43	100 1/3
4	9 1/3	24	56	44	102 2/3
5	11 2/3	25	58 1/3	45	105
6	14	26	60 2/3	46	107 1/3
7	16 1/3	27	63	47	109 2/3
8	18 2/3	28	65 1/3	48	112
9	21	29	67 2/3	49	114 1/3
10	23 1/3	30	70	50	116 2/3
11	25 2/3	31	72 1/3	51	119
12	28	32	74 2/3	52	121 1/3
13	30 1/3	33	77	53	123 2/3
14	32 2/3	34	79 1/3	54	126
15	35	35	81 2/3	55	128 1/3
16	37 1/3	36	84	56	130 2/3
17	39 2/3	37	86 1/3	57	133
18	42	38	88 2/3	58	135 1/3
19	44 1/3	39	91	59	137 2/3
20	46 2/3	40	93 1/3	60	140

TABLE OF AZIMUTHS.

Latitude.	1 mile.	2 miles.	3 miles.	4 miles.	5 miles.	6 miles.
°	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″
30	89 59 30	89 58 59.9	89 58 29.9	89 57 59.9	89 57 29.9	89 56 59.8
31	89 59 28.8	89 58 57.5	89 58 26.3	89 57 55.0	89 57 23.8	89 56 52.5
32	89 59 27.5	89 58 55.0	89 58 22.5	89 57 50.0	89 57 17.5	89 56 45.0
33	89 59 26.2	89 58 52.5	89 58 18.7	89 57 44.9	89 57 11.2	89 56 37.4
34	89 59 24.9	89 58 49.9	89 58 14.8	89 57 39.7	89 57 04.6	89 56 29.6
35	89 59 23.6	89 58 47.2	89 58 10.8	89 57 34.4	89 56 58.0	89 56 21.6
36	89 59 22.2	89 58 44.4	89 58 06.8	89 57 28.9	89 56 51.1	89 56 13.4
37	89 59 20.8	89 58 41.6	89 58 02.5	89 57 23.3	89 56 44.1	89 56 05.0
38	89 59 19.4	89 58 38.8	89 57 58.2	89 57 17.5	89 56 36.9	89 55 56.3
39	89 59 17.9	89 58 35.8	89 57 53.7	89 57 11.6	89 56 29.6	89 55 47.5
40	89 59 16.4	89 58 32.8	89 57 49.2	89 57 05.5	89 56 21.9	89 55 38.3
41	89 59 14.8	89 58 29.6	89 57 44.4	89 56 59.3	89 56 14.1	89 55 28.9
42	89 59 13.2	89 58 26.4	89 57 39.6	89 56 52.8	89 56 06.0	89 55 19.2
43	89 59 11.5	89 58 23.1	89 57 34.6	89 56 46.2	89 55 57.7	89 55 09.2
44	89 59 09.8	89 58 19.6	89 57 29.5	89 56 39.3	89 55 49.1	89 54 58.9
45	89 59 08.0	89 58 16.1	89 57 24.1	89 56 32.1	89 55 40.2	89 54 48.2
46	89 59 06.2	89 58 12.4	89 57 18.6	89 56 24.8	89 55 31.0	89 54 37.2
47	89 59 04.3	89 58 08.6	89 57 12.9	89 56 17.1	89 55 21.4	89 54 25.7
48	89 59 02.3	89 58 04.6	89 57 06.9	89 56 09.2	89 55 11.5	89 54 13.8
49	89 59 00.2	89 58 00.5	89 57 00.7	89 56 00.9	89 55 01.2	89 54 01.4
50	89 58 58.1	89 57 56.2	89 56 54.3	89 55 52.6	89 54 50.5	89 53 48.5

Latitude.	7 miles.	8 miles.	9 miles.	10 miles.	11 miles.	12 miles.
°	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″
30	89 56 29.8	89 55 59.8	89 55 29.8	89 54 59.7	89 54 29.7	89 53 59.7
31	89 56 21.3	89 55 50.0	89 55 18.8	89 54 47.6	89 54 16.3	89 53 45.1
32	89 56 12.5	89 55 40.0	89 55 07.6	89 54 35.1	89 54 02.6	89 53 30.1
33	89 56 03.6	89 55 29.9	89 54 56.1	89 54 22.3	89 53 48.5	89 53 14.8
34	89 55 54.5	89 55 19.4	89 54 44.4	89 54 09.3	89 53 34.2	89 52 59.1
35	89 55 45.2	89 55 08.8	89 54 32.3	89 53 55.9	89 53 19.5	89 52 43.1
36	89 55 35.6	89 54 57.8	89 54 20.0	89 53 42.3	89 53 04.5	89 52 26.7
37	89 55 25.8	89 54 46.6	89 54 07.4	89 53 28.2	89 52 49.1	89 52 09.9
38	89 55 15.7	89 54 35.1	89 53 54.5	89 53 13.9	89 52 33.2	89 51 52.6
39	89 55 05.4	89 54 23.3	89 53 41.2	89 52 59.1	89 52 17.0	89 51 34.9
40	89 54 54.7	89 54 11.1	89 53 27.5	89 52 43.8	89 52 00.2	89 51 16.6
41	89 54 43.7	89 53 58.5	89 53 13.4	89 52 28.2	89 51 43.0	89 50 57.8
42	89 54 32.4	89 53 45.6	89 52 58.8	89 52 12.0	89 51 25.2	89 50 38.4
43	89 54 20.8	89 53 32.3	89 52 43.8	89 51 55.4	89 51 06.9	89 50 18.5
44	89 54 08.7	89 53 18.5	89 52 28.4	89 51 38.2	89 50 48.0	89 49 57.8
45	89 53 56.3	89 53 04.3	89 52 12.3	89 51 20.4	89 50 28.4	89 49 36.4
46	89 53 43.4	89 52 49.5	89 51 55.7	89 51 01.9	89 50 08.1	89 49 14.3
47	89 53 30.0	89 52 34.3	89 51 38.6	89 50 42.9	89 49 47.2	89 48 51.4
48	89 53 16.1	89 52 18.4	89 51 20.7	89 50 23.0	89 49 25.3	89 48 27.6
49	89 53 01.7	89 52 01.9	89 51 02.1	89 50 02.4	89 49 02.6	89 48 02.8
50	89 52 46.6	89 51 44.7	89 50 42.8	89 49 40.9	89 48 39.0	89 47 37.1

TABLE OF OFFSETS FROM TANGENT TO PARALLEL.

Latitude.	1 mile.	2 miles.	3 miles.	4 miles.	5 miles.	6 miles.
°	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*
30	0.39	1.54	3.47	6.17	9.64	13.88
31	0.40	1.60	3.61	6.42	10.03	14.44
32	0.42	1.67	3.76	6.67	10.42	15.02
33	0.43	1.73	3.90	6.93	10.82	15.60
34	0.45	1.80	4.05	7.20	11.25	16.20
35	0.47	1.87	4.20	7.47	11.68	16.81
36	0.48	1.94	4.36	7.75	12.11	17.41
37	0.50	2.01	4.52	8.04	12.57	18.09
38	0.52	2.08	4.69	8.33	13.02	18.75
39	0.54	2.16	4.86	8.63	13.49	19.43
40	0.56	2.24	5.03	8.95	13.98	20.11
41	0.58	2.32	5.21	9.27	14.48	20.85
42	0.60	2.40	5.40	9.59	14.99	21.59
43	0.62	2.48	5.59	9.93	15.52	22.35
44	0.64	2.57	5.79	10.29	16.07	23.14
45	0.67	2.66	5.99	10.65	16.64	23.96
46	0.69	2.76	6.20	11.02	17.21	24.80
47	0.71	2.85	6.42	11.41	17.83	25.68
48	0.74	2.95	6.65	11.82	18.47	26.59
49	0.76	3.06	6.88	12.24	19.12	27.54
50	0.79	3.17	7.12	12.68	19.80	28.52

Latitude.	7 miles.	8 miles.	9 miles.	10 miles.	11 miles.	12 miles.
	Feet.	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*
30	18.89	24.67	31.23	38.55	46.65	55.52
31	19.66	25.68	32.49	40.12	48.54	57.77
32	20.44	26.69	33.78	41.71	50.47	60.06
33	21.23	27.74	35.10	43.34	52.44	62.41
34	22.05	28.80	36.45	45.00	54.45	64.80
35	22.89	29.89	37.83	46.71	56.62	67.26
36	23.74	31.01	39.25	48.45	58.63	69.77
37	24.62	32.16	40.70	50.24	60.79	72.35
38	25.52	33.33	42.19	52.08	63.02	75.00
39	26.44	34.54	43.71	53.97	65.30	77.71
40	27.40	35.78	45.29	55.91	67.65	80.51
41	28.37	37.06	46.90	57.91	70.07	83.39
42	29.38	38.38	48.57	59.97	72.56	86.35
43	30.42	39.74	50.29	62.09	75.13	89.41
44	31.50	41.14	52.07	64.28	77.78	92.57
45	32.61	42.59	53.91	66.55	80.53	95.84
46	33.76	44.10	55.81	68.90	83.37	99.22
47	34.95	45.65	57.78	71.34	86.32	102.72
48	36.19	47.27	59.83	73.86	89.37	106.36
49	37.48	48.95	61.96	76.49	92.55	110.15
50	38.82	50.70	64.17	79.22	95.86	114.08

SPECIMEN FIELD NOTES.

No. 1.

TITLE PAGE.

FIELD NOTES

OF THE SURVEY OF THE

THIRD STANDARD PARALLEL NORTH

THROUGH

Range No. 21 East

OF THE

PRINCIPAL BASE AND MERIDIAN,

IN THE

TERRITORY OF MONTANA,

AS SURVEYED BY

JAMES M. PAGE,
U. S. DEPUTY SURVEYOR,

UNDER HIS CONTRACT No. 97,
DATED JULY 23, 1880.

Survey commenced August 23, 1880.
Survey completed August 24, 1880.

[Second Page.]

NAMES AND DUTIES OF ASSISTANTS.

——— ——— .....Compassman.
NEWTON ORR .....Chainman.
BARCLAY JONES.....Chainman.
PETER SMITH .....Chainman.
JOHN PARKER.....Chainman.
WILLIAM MAULDIN .....Axeman.
HENRY NEWTON.....Axeman.
CLAYTON PAGE.....Flagman.

INDEX.

PRELIMINARY OATHS OF ASSISTANTS.

We, Newton Orr, Barclay Jones, Peter Smith, and John Parker, do solemnly swear that we will well and faithfully execute the duties of chain carriers; that we will level the chain upon even and uneven ground, and plumb the tally pins, either by sticking or dropping the same; that we will report the true distance to all notable objects, and the true lengths of all lines that we assist in measuring, to the best of our skill and ability, and in accordance with instructions given us, in the survey of the third standard parallel north through range No. 21 east of the principal base and meridian in the Territory of Montana.

NEWTON ORR, *Chainman.*
BARCLAY JONES, *Chainman.*
PETER SMITH, *Chainman.*
JOHN PARKER, *Chainman.*

Subscribed and sworn to before me this 2d day of August, 1880.
[SEAL.]
WILLIAM MARTIN,
Notary Public.

We, William Mauldin and Henry Newton, do solemnly swear that we will well and truly perform the duties of axemen, in the establishment of corners and other duties, according to instructions given us, and to the best of our skill and ability, in the survey of the third standard parallel north, through range No. 21 east of the principal base and meridian in the Territory of Montana.

WILLIAM MAULDIN, *Axeman.*
HENRY NEWTON, *Axeman.*

Subscribed and sworn to before me this 2d day of August, 1880.
[SEAL.]
WILLIAM MARTIN,
Notary Public.

THIRD STANDARD PARALLEL NORTH, THROUGH RANGE 21 EAST.

On the night of August 22, 1880, I took an observation on the star Polaris, in accordance with instructions contained in the Manual of Surveys, and drove pickets on the line thus established.

Survey commenced August 23, 1880, with a Burt's improved solar compass.

Before commencing this survey I test my compass on the line established last night, and find it correct.

I begin at the standard cor. to townships 13 north, ranges 20 and 21 east, which is a post, 4 inches square, marked—

S. C., T. 13 N., on N.;
R. 21 E., S. 31, on E., and
R. 20 E., S. 36, on W. faces, with 6 notches on N., E., & W. faces, and pits N., E., and W. of post, 6 ft. dist., and mound of earth around post. Thence I run

Chains.	
	East, on S. boundary sec. 31. Va. 20¼° E.
	Ascend
18.00	A point about 200 ft. above township cor., top of ridge.
40.00	Set a sandstone 18 × 8 × 5 ins., 12 ins. in the ground, for standard ¼ sec. cor. marked S. C. ¼ on N. face, dug pits 18 × 18 × 12 ins. E. & W. of stone, 5½ ft. dist., and raised a mound of earth 1½ ft. high, 3½ ft. base alongside; thence over high, rolling prairie.
57.00	Enter pine timber.

Third standard parallel north, through range No. 21 east—Continued.

Chains.	
80.00	Set a sandstone, 24 × 10 × 7 ins., 18 ins. in the ground, for standard cor. to secs. 31 and 32, marked S. C., with 5 notches on E. and 1 notch on W. edges; from which A pine, 12 ins. diam., bears N. 77° E., 41 lks. dist., marked T. 13 N., R. 21 E., S. 32 B. T.; A pine, 18 ins. diam., bears N. 50° W., 20 lks. dist., marked T. 13 N., R. 21 E., S. 31 B. T.; A pine, 7 ins. diam., bears S. 30° W., 119 lks. dist., marked T. 12 N., R. 21 E. S. 5 B. T. Land high, mountainous, hilly, and rolling. Soil sandy, gravel, and rocky; 4th rate. Timber, pine, 23 chs.; mostly dead and fallen.

East, on S. boundary sec. 32.
Through timber.
Va. 20¼° E.

3.75	Ravine, course S., about 30 ft. deep.
21.85	Ravine, course S. 20° E., about 20 ft. deep.
40.00	Set a sandstone, 18 × 14 × 5 ins, 12 ins. in the ground, for standard ¼ sec. cor., marked S. C., ¼ on N. face, and raised a mound of stone alongside. Pits impracticable.
59.00	Top of ridge, about 100 ft. high.
68.90	Ravine, course S., about 40 ft. deep.
80.00	Set a post, 4½ ft. long, 4 ins. square, with marked stone, 12 ins. in the ground, for standard cor. to secs. 32 and 33, marked— S. C., T. 13 N., R. 21 E., on N.; S. 33, on E., and S. 32, on W. faces, with 4 notches on E. and 2 notches on W. faces, and raised a mound of stone 2 ft. high, 4½ ft. base, around post. Land, high and mountainous. Soil, sandy, gravelly, and rocky—4th rate. Timber, pine, and fir, 80 chs.; mostly dead and fallen; some thick undergrowth same.

East, on S. boundary sec. 33.
Through timber.
Va. 20¼° E.

3.50	Old Indian trail, course N. 45° W.
6.00	Leave scattering and enter heavy timber.
13.50	Leave heavy timber, enter high, open prairie.
21.40	Old Indian trail, course S. 70° W.
30.00	Ascend.
40.00	Set a sandstone, 14 × 10 × 5 ins., 10 ins. in the ground, for standard ¼ sec. cor., marked S. C. ¼ on N. face, and raised a mound of stone 1½ ft. high, 3½ ft. base, alongside. Pits impracticable.
45.10	Old Indian trail, course N. 70° W.
53.00	Top of ridge, about 300 ft. high, course N. 30° E.
69.00	Leave prairie, enter timber.
80.00	Set a sandstone, 20 × 15 × 3 ins., 15 ins. in the ground, for standard cor. to secs. 33 and 34, marked S. C., with 3 notches on E. and W. edges; from which A pine, 8 ins. diam., bears N. 89¼° E. 88 lks. dist., marked T. 13 N., R. 21 E., S. 34 B. T.; A pine, 7 ins. diam., bears N. 74° W., 6 lks. dist.; marked T. 13 N., R. 21 E., S. 33, B. T.; A pine, 9 ins. diam., bears S. 4¼° W., 62 lks. dist.; marked T. 12 N., R. 21 E., S. 3, B. T. Land, high and mountainous. Soil, sandy and rocky; 4th rate. Timber, pine and fir, 24.50 chs., with some thick undergrowth same.

Chains.	
	East, on S. boundary sec. 34.
	Through timber.
	Va. 20¼° E.
9.40	Enter aspen thicket.
13.80	Ravine, about 12 ft. deep, and leave thicket. Ascend.
23.84	A pine, 12 ins. diam.
40.00	Set a sandstone, 16 × 12 × 5 ins., 11 ins. in the ground, for standard ¼ sec. cor.; marked S. C. ¼ on N. face; from which
	A pine, 11 ins. diam., bears N. 54¾° E., 39 lks. dist.; marked S. C. ¼ S. B. T.;
	A pine, 10 ins. diam., bears S. 56° W., 17 lks. dist.; marked S. C. ¼ S. B. T.
53.55	A pine, 6 ins. diam.
80.00	Top of mountain. Set a post, 4½ ft. long, 4 ins. square, with marked stone, 12 ins. in the ground, for standard cor. to secs. 34 and 35; marked—
	S. C., T. 13 N., R. 21 E., on N.;
	S. 35, on E., and
	S. 34, on W. faces, with 2 notches on E. and 4 notches on W. faces; from which
	A pine, 12 ins. diam., bears N. 45° E., 15 lks. dist.; marked T. 13 N., R. 21 E., S. 35 B. T.;
	A pine, 15 ins. diam., bears S. 48° W., 54 lks. dist.; marked T. 12 N., R. 21 E., S. 2 B. T.
	No other trees within limits, and raised a mound of stone around post.
	Land, high, mountainous, and rolling.
	Soil, sandy and rocky; 4th rate.
	Timber, pine and fir—some good quality—thick undergrowth of same and aspen; 80 chs.
	August 23, 1880.

	East, on S. boundary sec. 35.
	Va. 20¼° E.
	Descend through timber.
37.50	A point about 300 ft. below last sec. cor. on top of mountain; ravine, course N. 35° E. and ascend.
40.00	Set a sandstone 14 × 12 × 5 ins., 10 ins. in the ground, for standard ¼ sec. cor.; marked S. C. ¼ on N. face; from which
	A pine, 12 ins. diam., bears N. 79° E., 140 lks. dist., marked S. C. ¼ S. B. T.
	No other tree within limits, and raised a mound of stone alongside.
47.00	Top of ridge, about 150 ft. above ravine, and descend over broken, rolling ground.
80.00	Set a sandstone, 24 × 18 × 5 ins., 18 ins. in the ground, for standard cor. to secs. 35 and 36, marked S. C. on N., with 1 notch on E. and 5 notches on W. edges, and raised a mound of stone 2 ft. high, 4½ ft. base alongside.
	Pits impracticable.
	Land, high and broken.
	Soil, sandy and gravelly; 4th rate.
	Timber, pine and fir, mostly dead and fallen. Some thick undergrowth same; 80 chs.

	East on S. boundary sec. 36.
	Va. 20¼° E.
	Ascend, through timber.
7.50	Top of ridge, course N. 20° E., about 100 ft. high, and descend.
22.00	A pine, 10 ins. diam.
40.00	Set a sandstone 16 × 10 × 6 ins. 11 ins. in the ground, for standard ¼ sec. cor. marked S. C. ¼ on N. face; from which
	A pine, 12 ins. diam., bears N. 58° W., 12 lks. dist., marked S. C. ¼ S. B. T.;
	A pine, 11 ins. diam., bears S. 33° E., 36 lks. dist., marked S. C. ¼ S. B. T.

Third standard parallel north, through range No. 21 east—Continued.

Chains.	
47.42	A pine, 12 ins. diam.
72.38	A pine, 10 ins. diam.
79.40	A point about 450 ft. below top of ridge. Small ravine, course N. 65° E. and ascend.
80.00	Set a post, 4½ ft. long, 4 ins. square, with marked stone, 12 ins. in the ground, for standard cor. to Tps. 13 N., Rs. 21 and 22 E., marked— S. C., T. 13 N., on N.; R. 22 E., S. 31, on E., and R. 21 E., S. 36, on W. faces; with 6 notches on N., E., and W. faces; and raised a mound of stone 2 ft. high, 4½ ft. base, around post.
	Land, high, mountainous, and rolling.
	Soil, sandy and rocky; 4th rate.
	Timber, pine; thick undergrowth same; 80 chs.
	August, 24, 1880.

GENERAL DESCRIPTION.

This line runs over the east slope of the Little Snowy Mountains. The townships on each side are rough and broken, but contain large groves of pine and fir timber of fair quality, and some springs and small streams of pure clear water.

JAMES M. PAGE,
United States Deputy Surveyor.

FINAL OATHS FOR SURVEYORS.

LIST OF NAMES.

A list of the names of the individuals employed by James M. Page, U. S. deputy surveyor, to assist in running, measuring, and marking the lines and corners described in the foregoing field notes of the survey of the third standard parallel north, through range No. 21 east of the principal base and meridian, in the Territory of Montana, showing the respective capacities in which they acted.

——— ———	Compassman.
NEWTON ORR	Chainman.
BARCLAY JONES	Chainman.
PETER SMITH	Chainman.
JOHN PARKER	Chainman.
WILLIAM MAULDIN	Axeman.
HENRY NEWTON	Axeman.
CLAYTON PAGE	Flagman.

FINAL OATHS OF ASSISTANTS.

We hereby certify that we assisted James M. Page, United States deputy surveyor, in surveying all those parts or portions of the third standard parallel north through range No. 21 east, of the principal base and meridian in the Territory of Montana, as are represented in the foregoing field notes as having been surveyed by him and under his direction; and that said survey has been in all respects, to the best of our knowledge and belief, well and faithfully surveyed, and the corner monuments established according to the instructions furnished by the United States surveyor-general for Montana.

——— ———, *Compassman.*
NEWTON ORR, *Chainman.*
BARCLAY JONES, *Chainman.*
PETER SMITH, *Chainman.*
JOHN PARKER, *Chainman.*
WILLIAM MAULDIN, *Axeman.*
HENRY NEWTON, *Axeman.*
CLAYTON PAGE, *Flagman.*

Subscribed and sworn to before me this 1st day of September, 1880.
[SEAL.] WILLIAM MARTIN, *Notary Public.*

FINAL OATH OF UNITED STATES DEPUTY SURVEYOR.

I, James M. Page, United States deputy surveyor, do solemnly swear that in pursuance of instructions received from Roswell H. Mason, United States surveyor-general for Montana, bearing date the tenth day of August, 1880, I have well, faithfully, and truly, in my own proper person, and in strict conformity with the instructions furnished by the United States surveyor-general for Montana, the Surveying Manual, and the laws of the United States, surveyed all those parts or portions of the third standard parallel north through range No. 21 east of the principal base and meridian in the Territory of Montana, as are represented in the foregoing field notes as having been surveyed by me and under my direction; and I do further solemnly swear that all the corners of said surveys have been established and perpetuated in strict accordance with the Surveying Manual, printed instructions, the special instructions of the United States surveyor-general for Montana, and in the specific manner described in the field notes, and that the foregoing are the *true* field notes of such survey; and should any fraud be detected I will suffer the penalty of perjury under the provisions of an act of Congress approved August 8, 1846.

JAMES M. PAGE,
United States Deputy Surveyor.

Subscribed and sworn to before me this 1st day of September, 1880.
[SEAL.] WILLIAM MARTIN, *Notary Public.*

SPECIMEN FIELD NOTES.—No. 2.

This specimen shows only the body of the field notes of the survey of the sixth auxiliary meridian, east through township No. 16 north of the base and principal meridian, in the Territory of Montana. The oaths and other portions omitted would be of like nature to those shown in Specimen Field Notes No. 1.

SIXTH AUXILIARY MERIDIAN EAST THROUGH TOWNSHIP NO. 16 NORTH.

On the night of September 2, 1880, I took an observation on the star Polaris, in accordance with instructions contained in the Manual of Surveys, and drove pickets on the line thus established.

Survey commenced September 3, 1880, with a Burt's improved solar compass.

Chains.	
	Before commencing this survey I test my compass on the line established last night, and find it correct.
	I begin at the cor. to Tps. 15 and 16 N., Rs. 24 and 25 E., which is a post, 4 ins. square, marked—
	T. 16 N., S. 31, on N. E.;
	R. 25 E., S. 6, on S. E.;
	T. 15 N., S. 1, on S. W., and
	R. 24 E., S. 36, on N. W. faces, with 6 notches on each edge, and pits N., S., E., and W. of post, 6 ft. dist., and mound of earth around post. Thence I run
	North, bet. secs. 31 and 36.
	Va. 20¼° E.
10.00	Dry channel, 10 lks. wide, course E.
40.00	Set a sandstone 18 × 10 × 3 ins. 12 ins. in the ground for ¼ sec. cor. marked ¼ on W. face; dug pits 18 × 18 × 12 ins. N. and S. of stone, 5½ ft. dist., and raised a mound of earth 1½ ft. high, 3½ ft. base, alongside.
42.60	Stream 6 lks. wide, course N. 70° W.
55.50	Enter timber.
56.45	Ravine about 30 ft. deep, course S. 60° W., and ascend.
60.70	Top of ridge about 50 ft. above ravine, and descend.
72.40	Foot of ridge about 50 ft. below top. Course E. and W.
80.00	Set a sandstone 18 × 11 × 3 ins. 12 ins. in the ground for cor. to secs. 25, 30, 31, and 36, marked with 5 notches on N. and 1 notch on S. edges; from which
	A pine, 6 ins. diam., bears N. 62° E., 41 lks. dist., marked T. 16 N., R. 25 E., S. 30 B. T.;
	A pine, 18 ins. diam., bears S. 41¼° E., 93 lks. dist., marked T. 16 N., R. 25 E., S. 30 B. T.;

Chains.	
	A pine, 12 ins. diam., bears S. 83¾° W., 109 lks. dist., marked T. 16 N., R. 24 E., S. 36 B. T.; A pine, 11 ins. diam., bears N. 47° W., 45 lks. dist., marked T. 16 N., R. 24 E., S. 25 B. T. Land, rolling. Soil, sandy and clay—2d and 3d rate. Timber, pine; large and good quality, with some thick undergrowth same; 24.50 chs.
	North, bet. secs. 25 and 30. Va. 20¼° E. Through timber.
2.75	Descend.
7.00	Leave timber.
18.90	Point about 40 ft. below last cor.; deep cut channel; stream 12 lks. wide; course N. 75° W.
40.00	Set a sandstone 15 × 11 × 6 ins. 10 ins. in the ground for ¼ sec. cor., marked ¼ on W. face; dug pits 18 × 18 × 12 ins. N. and S. of stone, 5½ ft. dist., and raised mound of earth 1½ ft. high, 3½ ft. base, alongside.
45.00	Enter bottom.
80.00	Set a post 4½ ft. long, 4 ins. square, with marked stone 12 ins. in the ground for cor. to secs. 19, 24, 25, and 30, marked— T. 16 N., S. 19, on N. E.; R. 25 E., S. 30, on S. E.; R. 24 E., S. 25, on S. W., and S. 24, on N. W. faces, with 4 notches on N. and 2 notches on S. edges; dug pits 18 × 18 × 12 ins. in each sec. 5½ ft. dist., and raised mound of earth 2 ft. high, 4½ ft base, around post. Land, rolling and level. Soil, south 45 chs., clay and sandy—2d rate; north 35 chs.—1st rate. Timber, pine, of good quality; 7 chs.
	North, bet. secs. 19 and 24. Va. 20 ¼° E.
35.40	Dry channel, 20 lks. wide, course E.
40.00	Set a sandstone 16 × 8 × 4 ins. 11 ins. in the ground, for ¼ sec. cor., marked ¼ on W. face; dug pits 18 × 18 × 12 ins. N. and S. of stone, 5½ ft. dist., and raised a mound of earth 1½ ft. high, 3½ ft. base, alongside.
42.45	Ford's Creek, 25 lks. wide, course E. and enter willow brush.
47.30	Bend in Ford's Creek, course N. 25° W., to avoid which and save two crossings, I offset W. 2.00 chs., thence N. on offset line 7.40 chs., thence E. 2.00 chs. to line.
54.70	On line on N. side of bend, course of creek at this point N. 45° E. and leave willow brush.
61.45	Dry channel, 25 lks. wide, course S. 70° E.
80.00	Set a sandstone 18 × 10 × 4 ins. 12 ins. in the ground, for cor. to secs. 13, 18, 19, and 24, marked with 3 notches on the N. and S. edges; dug pits 18 × 18 × 12 ins. in each sec., 5½ ft. dist., and raised a mound of earth 2 ft. high, 4½ ft. base, alongside. Land, nearly level bottom. Soil, sandy loam and clay—1st and 2d rate. No timber. Thick willow and box elder brush along Ford's Creek.
	North bet. secs. 13 and 18. Va. 20¼° E. Leave bottom, and ascend gradually.
33.00	A point about 40 ft. above bottom, top of low bluff.
38.00	Ravine, about 15 ft. deep, course E. and ascend gradually over rolling ground.
40.00	Set a sandstone 14 × 10 × 4 ins. 10 ins. in the ground for ¼ sec. cor., marked ¼ on W. face; dug pits 18 × 18 × 12 ins. N. and S. of stone, 5½ ft. dist., and raised mound of earth 1½ ft. high, 3½ ft. base, alongside.
60.60	Top of low ridge, about 60 ft. high, and descend.

Sixth auxiliary meridian east, through township No. 16 north—Continued.

Chains.	
80.00	Set a post, 4½ ft. long, 4 ins. square, with marked stone, 12 ins. in the ground, for cor. to secs. 7, 12, 13, and 18, marked— T. 16 N., S. 7, on N. E.; R. 25 E., S. 18, on S. E.; R. 24 E., S. 13, on S. W., and S. 12, on N. W. faces, with 2 notches on N. and 4 notches on S. edges; dug pits 18 × 18 × 12 ins. in each sec., 5½ ft. dist., and raised a mound of earth, 2 ft. high, 4½ ft. base, around post.
	Land rolling.
	Soil, sandy and clay loam—2d rate.
	No timber. *September* 3, 1880.

	North, bet. secs. 7 and 12. Var. 20¼° E.
	Ascend gradually.
3.40	A point about 20 ft. above last cor. top of low ridge, and descend.
39.50	Stream 3 lks. wide, course E., and ascend over rolling ground.
40.00	Set a sandstone 18 × 6 × 5 ins. 12 ins. in the ground, for ¼ sec. cor. marked ¼ on W. face; dug pits 18 × 18 × 12 ins. N. and S. of stone, and raised a mound of earth 1½ ft. high, 3½ ft. base, alongside.
71.00	Descend steep bluff.
71.85	A point about 40 ft. below top of bluff. Stream 10 lks. wide, course E., and enter bottom land.
77.00	Leave bottom land and ascend bluff, course S. 70° E.
80.00	A point about 40 ft. above bottom, and set a sandstone 30 × 8 × 4 ins. 23 ins. in the ground for cor. to secs. 1, 6, 7, and 12, marked with 1 notch on N. and 5 notches on S. edges; dug pits 18 × 18 × 12 ins. in each sec. 5½ ft. dist., and raised a mound of earth 2 ft. high, 4½ ft. base, alongside.
	Land, rolling.
	Soil, sandy and clay—2d rate.
	No timber.

	North, bet. secs. 1 and 6. Va. 20¼° E.
18.60	Stream, 4 lks. wide, course E.
40.00	Set a sandstone, 30 × 9 × 4 ins. 23 ins. in the ground, for ¼ sec. cor., marked ¼ on W. face; dug pits 18 × 18 × 12 ins. N. and S. of stone, 5½ ft. dist., and raised a mound of earth 1½ ft. high, 3½ ft. base, alongside.
61.00	Stream, 8 lks. wide, course S. 40° E.
78.42	Intersect the fourth standard parallel north at a point 6.95 chs. E. of the standard cor. to secs. 35 and 36, T. 17 N., R. 24 E., at which point I set a post 4½ ft. long, 4 ins. square, with marked stone, 12 ins. in the ground, marked— C. C., T. 16 N., on S.; R. 25 E., S. 6, on E., and R. 24 E., S. 1, on W. faces, with 6 notches on S., E., and W. faces; dug pits 24 × 18 × 12 ins. lengthwise on each line, S., E., and W. of post, 6 ft. dist., and raised a mound of earth 2 ft. high, 4½ ft. base, around post.
	Land, level.
	Soil, sandy loam—1st and 2d rate.
	No timber. *September* 4, 1880.

31.50 chs. of this line runs through timber.

GENERAL DESCRIPTION.

Townships 16 N., Rs. 24 and 25 E., are generally rolling table lands, producing an abundant growth of grass, and there is a large amount of good bottom land along Ford's Creek and its tributaries. About 2 miles east of the closing cor. is a lake some two miles wide, by 2½ miles long, lying in Tps. 16 and 17 N., R. 25 E.

JAMES M. PAGE,
U. S. Deputy Surveyor.

SEPTEMBER 4, 1880.

SPECIMEN FIELD NOTES.—No. 3.

These specimen field notes show only the body of the field notes of the survey of the west and north boundaries of T. 13 N., R. 24 E., of the base and principal meridian in the Territory of Montana, it being assumed that the south and east boundaries of said township have been previously established by running the third standard parallel north, and the sixth auxiliary meridian east. The oaths and other portions omitted would be of like nature to those shown in Specimen Field Notes No. 1, it being remembered that only *one* set of chainmen is required in the survey of township lines.

EXTERIOR BOUNDARIES T. 13 N., R. 24 E.

Survey commenced September 21, 1880, with a Burt's improved solar compass.

Chains.	
	I begin at the standard cor. to Tps. 13 N., Rs. 23 and 24 E., which is a post 4 ins. square, marked— S. C., T. 13 N., on N.; R. 24 E., S. 31, on E., and R. 23 E., S. 36, on W. faces, with 6 notches on N., E., and W. faces, and pits N., E., and W. of post 6 feet dist., and mound of earth around post. Thence I run
	North between secs. 31 and 36. Va. 20¼° E.
	Descend over rough, broken ground.
1.50	Ravine about 20 ft. deep, course N. 80° E., and ascend.
15.00	Top of hill, about 50 ft. above ravine, and descend.
30.00	Head of ravine, course N. 30° E.
35.60	Descend abruptly.
40.60	A point about 150 ft. below top of hill—foot of broken bluff, course E. and W., and set a sandstone 16 × 16 × 6 ins., 11 ins. in the ground, for ¼ sec. cor., marked ¼ on W. face, and raised a mound of stone alongside. Pits impracticable.
42.00	Stream, 4 lks. wide, course E., and ascend.
47.00	Top of ridge about 80 ft. above stream, and descend.
55.35	Ravine, about 30 ft. deep, course N. 45° E.
61.95	A point about 150 ft. below top of ridge. Spring branch, 4 lks. wide, course S. 70° E., ascend
74.50	A point about 150 ft. above stream, and enter timber.
80.00	Set a sandstone 24 × 15 × 8 ins. 18 ins. in the ground for cor. to secs. 25, 30, 31, and 36, marked with 5 notches on N. and 1 notch on S. edges; from which A pine, 5 ins. diam., bears N. 22½° E., 30 lks. dist., marked T. 13 N., R. 24 E., S. 30 B. T. A pine, 12 ins. diam., bears S. 27¼° E., 87 lks. dist., marked T. 13 N., R. 24 E., S. 31 B. T.; A pine, 10 ins. diam., bears S. 1° W., 40 lks. dist., marked T. 13 N., R. 23 E., S. 36 B. T., A pine, 17 ins. diam., bears N. 42° W., 65 lks. dist., marked T. 13 N., R. 23 E., S. 25 B. T.,
	Land, mountainous, rough, and broken. Soil, sandy and stony—4th rate. Timber, pine, 5.50 chs., and cottonwood along streams.
	North, bet. secs. 25 and 30. Va. 20¼° E.
	Descend through timber.
8.85	Ravine, about 10 ft. deep, course N. 70° E.
19.00	A point about 175 ft. below cor., ravine, about 60 ft. deep, course S. 80° E. and ascend.
21.00	Leave timber.
24.00	A point about 100 feet above ravine, top of hill, and descend gradually over rolling ground.
40.00	Set a sandstone 16 × 13 × 3 ins. 11 ins. in the ground, for ¼ sec. cor., marked ¼ on W. face and raised a mound of stone alongside.
75.50	Spring branch, 2 lks. wide, course E. and ascend.
80.00	A point about 40 ft. above stream, and set a post 4 ft. long, 4 ins. square, with marked stone 12 ins. in the ground for cor. to secs. 19, 24, 25, and 30, marked— T. 13 N., S. 19, on N. E.; R. 24 E., S. 30, on S. E.; R. 23 E., S. 25, on S. W., and S. 24, on N. W. faces, with 4 notches on N. and 2 notches on S. edges, and raised a mound of stone, 2 ft. high, 4½ ft. base, around post.

Exteriors T. 13 N., R. 24 E.—Continued.

Chains.	
	Land, hilly, rough, and broken. Soil, sandy and rocky—4th rate. Timber, pine, 21.00 chs., and undergrowth same.
	North, bet. secs. 19 and 24. Va. 20¼° E. Descend gradually.
4.20	A point about 40 ft. below cor. Spring branch 3 lks. wide, course S. 70° E.
18.50	A point about 50 ft. above stream, top of ridge, course E. and W., and descend over rolling ground.
40.00	Set a sandstone 14 × 14 × 4 ins. 10 ins. in the ground, for ¼ sec. cor., marked ¼ on W. face, and raised a mound of stone alongside. Pits impracticable.
48.85	Stream, 4 lks. wide, course E.
64.95	Stream, 4 lks. wide, course S. 70° E.
80.00	Set a sandstone 24 × 18 × 6 ins. 18 ins. in the ground, for cor. to secs. 13, 18, 19, and 24, marked with 3 notches on N. and S. edges; dug pits 18 × 18 × 12 ins. in each sec., 5½ ft. dist., and raised a mound of earth alongside.
	Land, broken and rolling. Soil, rocky and sandy loam—2d and 3d rate. Some scattering pine along streams, with willow and rose brush.
	North, bet. secs. 13 and 18. Va. 20¼° E. Over rolling ground.
40.00	Set a sandstone, 18 × 14 × 3 ins. 12 ins. in the ground, for ¼ sec. cor., marked ¼ on W. face; dug pits 18 × 18 × 12 ins. N. and S. of stone, 5½ ft. dist., and raised a mound of earth 1½ ft. high, 3½ ft. base, alongside.
80.00	Set a post, 4 ft. long, 4 ins. square, with marked stone, 12 ins. in the ground, for cor. to secs. 7, 12, 13, and 18, marked— T. 13 N., S. 7, on N. E.; R. 24 E., S. 18, on S. E.; R. 23 E., S. 13, on S. W., and S. 12, on N. W. faces, with 2 notches on N. and 4 notches on S. edges; dug pits 18 × 18 × 12 ins. in each sec., 5½ ft. dist., and raised a mound of earth, 2 ft. high, 4½ ft. base, around post.
	Land, rolling. Soil, sandy loam—2d rate. No timber. *September* 21, 1880.
	North, bet. secs. 7 and 12. Va. 20¼° E.
40.00	Set a sandstone, 16 × 12 × 3 ins. 11 ins. in the ground, for ¼ sec. cor., marked ¼ on W. face; dug pits 18 × 18 × 12 ins. N. and S. of stone, 5½ ft. dist., and raised a mound of earth 1½ ft. high, 3½ ft. base, alongside.
54.00	Stream, 7 lks. wide, course N. 40° E.
80.00	Set a post, 4 ft. long, 4 ins. square, with marked stone, 12 ins. in the ground, for cor. to secs. 1, 6, 7, and 12, marked— T. 13 N., S. 6, on N. E.; R. 24 E., S. 7, on S. E.; R. 23 E., S. 12, on S. W., and S. 1, on N. W. faces, with 1 notch on N. and 5 notches on S. edges; dug pits 18 × 18 × 12 ins. in each sec., 5½ ft. dist., and raised a mound of earth, 2 ft. high, 4½ ft. base, around post.
	Land, rolling. Soil, sandy loam—2d rate. No timber; willow brush along stream.

Chains.	
	North, bet. secs. 1 and 6. Va. 20¼° E.
34.00	Stream, 6 lks. wide, course E.
40.00	Set a sandstone 22 × 8 × 3 ins. 16 ins. in the ground, for ¼ sec. cor., marked ¼ on W. face; dug pits 18 × 18 × 12 ins. N. and S. of stone, 5½ ft. dist., and raised a mound of earth, 1½ ft. high, 3½ ft. base, alongside.
80.00	Set a post, 4½ ft. long, 4 ins. square, with marked stone, 12 ins. in the ground for cor. to Tps. 13 and 14 N., Rs. 23 and 24 E., marked— T. 14 N., S. 31, on N. E.; R. 24 E., S. 6, on S. E.; T. 13 N., S. 1, on S. W., and R. 23 E., S. 36, on N. W. faces, with 6 notches on each edge; dug pits 24 × 18 × 12 ins. lengthwise on each line, N., S., E., and W. of post, 6 ft. dist., and raised a mound of earth, 2 ft. high, 4½ ft. base, around post.
	Land, rolling. Soil, sandy loam—2d rate. No timber.

From the cor. to Tps. 13 and 14 N., Rs. 23 and 24 E., I run east on a random line, between said townships, the variation of my compass being 20¼° E. I set temporary half-mile and mile corners at each 40 and 80 chains, and find the township line to be 5 miles 77 chs. and 95 lks. long, and the falling to be 45 lks. N. of the cor. to Tps. 13 and 14 N., Rs. 24 and 25 E. The correction for the *true* line will therefore be 7½ lks. south, and 2.05 chs. west per mile, and its course will be N. 79° 57′ W.

From the cor. to Tps. 13 and 14 N., Rs. 24 and 25 E., which is a post, 4 ins. square, marked—
T. 14 N., S. 31, on N. E.;
R. 25 E., S. 6, on S. E.;
T. 13 N., S. 1, on S. W., and
R. 24 E., S. 36, on N. W. faces, with 6 notches on each edge and pits N., S. E., and W. of post, 6 ft. dist., and mound of earth around post.
I run

	N. 79° 57′ W. on a true line bet. secs. 1 and 36. Va. 20° E.
	Over very nearly level ground.
9.28	Stream, 10 lks. wide, course S. 70° E.
15.40	Same stream, course N. 50° E.
40.00	Set a red sandstone, 18 × 10 × 6 ins., 12 ins. in the ground, for ¼ sec. cor., marked ¼ on N. face; dug pits 18 × 18 × 12 ins. E. and W. of stone, 5½ ft. dist., and raised a mound of earth, 1½ ft. high, 3½ ft. base, alongside.
80.00	Set a sandstone, 18 × 14 × 6 ins., 12 ins. in the ground, for cor. to secs. 1, 2, 35, and 36, marked with 1 notch on E. and 5 notches on W. edges; dug pits 18 × 18 × 12 ins. N., S., E., and W. of stone, 5½ ft. dist., and raised a mound of earth 2 ft. high, 4½ ft. base, alongside.
	Land, level. Soil, rich loam—1st class. No timber.

	N. 79° 57′ W. on a true line bet. secs. 2 and 35. Va. 20¼° E.
	Over nearly level ground.
40.00	Set a sandstone, 16 × 10 × 5 ins., 11 ins. in the ground, for ¼ sec. cor., marked ¼ on N. face; dug pits 18 × 18 × 12 ins. E. and W. of stone, 5½ ft. dist., and raised a mound of earth 1½ ft. high, 3½ ft. base, alongside.
45.70	S. fork of Spring Creek, 15 lks. wide, course N. 40° E.

[*Exteriors T. 13 N., R. 24 E.*—Continued.

Chains.	
80.00	Set a post, 4 ft. long, 4 ins. square, with marked stone, 12 ins. in the ground, for cor. to secs. 2, 3, 34 and 35, marked— T. 14 N., S. 35, on N. E.; R. 24 E., S. 2, on S. E.; T. 13 N., S. 3, on S. W., and S. 34, on N. W. faces, with 2 notches on E. and 4 notches on W. edges; dug pits 18 × 18 × 12 ins. in each sec., 5½ ft. dist., and raised a mound of earth 2 ft. high, 4½ ft. base, alongside.
	Land, level.
	Soil, rich loam—1st rate.
	No timber.
	September 22, 1880.

N. 79° 57′ W. on a true line, bet. secs. 3 and 34.
Va. 20¼° E.

	Ascend gradually.
18.60	Enter pine timber, in open grove.
40.00	Set a sandstone 18 × 8 × 6 ins. 12 ins. in the ground, for ¼ sec. cor., marked ¼ on N. face; from which A pine, 12 ins. diam., bears N. 23° W., 89 lks. dist., marked ¼ S. B. T. No other tree in limits, and raised a mound of stone alongside.
52.50	Spring branch, 3 lks. wide, course S. 50° E.
80.00	A point about 150 ft. above last sec. cor. and set a sandstone 18 × 8 × 6 ins. 12 ins. in the ground, for cor. to secs. 3, 4, 33, and 34, marked with 3 notches on E. and W. edges; from which A pine, 36 ins. diam., bears N. 45° E., 82 lks. dist., marked T. 14 N., R. 24 E., S. 34 B. T.; A pine, 14 ins. diam., bears S. 24° W., 110 lks. dist., marked T. 13 N., R. 24 E., S. 4 B. T. No other trees within limits, and raised a mound of stone alongside.
	Land, slightly undulating.
	Soil, sandy loam—2d rate.
	Timber, pine of fine quality; 61.40 chs.

N. 79° 57′ W. on a true line, bet. secs. 4 and 33.
Va. 20½° E.

11.60	Spring branch, 6 lks. wide, course N. 20° E.
17.50	Leave timber.
40.00	Set a sandstone 20 × 10 × 4 ins. 15 ins. in the ground for ¼ sec. cor., marked ¼ on N. face, and raised a mound of stone, covered with earth, 2 ft. high, 4½ ft. base, alongside.
76.30	Spring branch, 2 lks. wide, course S. 50° E.
80.00	Set a post 4 ft. long, 4 ins. square, with marked stone, 12 ins. in the ground, for cor. to secs. 4, 5, 32, and 33, marked— T. 14 N., S. 33, on N. E.; R. 24 E., S. 4, on S. E.; T. 13 N., S. 5, on S. W., and S. 32, on N. W. faces, with 4 notches on E. and 2 notches on W. edges; dug pits 18 × 18 × 12 ins. in each sec., 5½ ft. dist., and raised a mound of earth 2 ft. high, 4½ ft. base, around post.
	Land, nearly level.
	Soil, sandy loam—2d rate.
	Timber, pine; 17.50 chs.

N. 79° 57′ W. on a true line, bet. secs. 5 and 32.
Va. 20¼° E.

36.10	Spring branch, 2 lks. wide, course S. 50° E.
40.00	Set a post, 3 ft. long, 3 ins. square, with marked stone, 12 ins. in the ground, for ¼ sec. cor., marked ¼ S. on N. face; dug pits 18 × 18 × 12 ins. E. and W. of post, 5½ ft. dist., and raised a mound of earth 1½ ft. high, 3½ ft. base, around post.

Exteriors T. 13 N., R. 24 E.—Continued.

Chains.	
80.00	Set a sandstone 18 × 12 × 6 ins. 12 ins. in the ground, for cor. to secs. 5, 6, 31, and 32, marked with 5 notches on E. and 1 notch on W. edges; dug pits 18 × 18 × 12 ins. in each sec., 5½ ft. dist., and raised a mound of earth 2 ft. high, 4½ ft. base, alongside.
	Land, level.
	Soil, sandy loam—2d rate.
	No timber.
	N. 79° 57′ W. on a true line, bet. secs. 6 and 31.
	Va. 20¼° E.
40.00	Set a sandstone 22 × 10 × 3 ins. 16 ins. in the ground, for ¼ sec. cor., marked ¼ on N. side; dug pits 18 × 18 × 12 ins. E. and W. of stone, 5½ ft. dist., and raised a mound of earth 1½ ft. high, 3½ ft. base, alongside.
77.95	The cor. to Tps. 13 and 14 N., Rs. 23 and 24 E.
	Land, level.
	Soil, sandy loam—2d rate.
	No timber.

September 23, 1880.

2 miles 19 chs. and 90 lks. of these lines run over mountainous land, or through timber.

GENERAL DESCRIPTION.

The northwestern portion of this township is rough, hilly, and broken. The remainder consists of rolling land, with much rich bottom land along Spring Creek and its numerous tributaries. On the hilly and rolling land are large groves of pine timber. There is one settler near the center of the township. The township should be subdivided.

JAMES M. PAGE,
U. S. Deputy Surveyor.

SPECIMEN FIELD NOTES.—No. 4.

Resurvey of a portion of the exterior boundaries of T. 25 N., R. 2 W., Willamette meridian, Oregon.

In subdividing this township I commenced by running north on a blank line, on the east boundary of sec. 36, va. 17° 55′ E., and at 40 chs. I found the ¼ sec. cor. to be N. 80° E. 16 lks. dist., and at 80 chs. the sec. cor. to be E. 30 lks. dist. I therefore continued the true line north, found that no portion of this east boundary was in alignment, and that many of the corners were nearly obliterated, but that the cor. to Tps. 25 and 26 N., Rs. 1 and 2 W., was due north of the starting cor. As T. 25 N., R. 1 W., had not been subdivided, and, consequently, no subdivision lines had been closed on either side of this east boundary, I resurveyed the same as follows:

Finding the standard cor. to Tps. 25 N., Rs. 1 and 2 W., was a post greatly decayed, and with the marks nearly obliterated, I destroyed all traces of old cor. and re-established it as follows:

Set a post, 4½ ft. long, 4 ins. square, 24 ins. in the ground, for standard cor. to Tps. 25 N., Rs. 1 and 2 W., marked—

S. C., T. 25 N., on N.;
R. 1 W., S. 31, on E., and
R. 2 W., S. 36, on W. faces, with 6 notches on N., E., and W. faces; from which

A black oak, 20 ins. diam., bears N. 37° E., 27 lks. dist., marked T. 25 N., R. 1 W., S. 31 B. T.;

A burr oak, 24 ins. diam., bears N. 43° W., 35 lks. dist., marked T. 25 N., R. 2 W., S. 36 B. T.;

A maple, 18 ins. diam., bears S. 27° W., 39 lks. dist., marked T. 24 N., R. 2 W., S. 1 B. T.

Chains.	
	Thence I run
	North, bet. secs. 31 and 36.
	Va. 17° 55′ E.
	Through timber.
1.00	Brook, 5 lks. wide, course N. W.
18.00	Foot of hill, course N. W. and S. E.
20.00	Top of hill, about 50 ft. high.
40.00	Set a sandstone 20 × 8 × 3 ins., 15 ins. in the ground, for ¼ sec. cor., marked ¼ on W. side; dug pits 18 × 8 × 12 ins. N. and S. of stone 5½ ft. dist., and raised a mound of earth, 1½ ft. high, 3½ ft. base, alongside.
	From this point the old ¼ sec. cor., which is a decayed stake, with marks almost obliterated, bears N. 80° E., 16 lks. dist. I destroyed this stake, and also the marks on the stump of a beech tree, described as a bearing tree, in the field notes of original survey. No traces could be found of poplar tree described as bearing tree in said field notes.
55.00	Descend.
57.00	Foot of hill, about 40 ft. high, and enter rich level land.
72.60	A brook, 10 lks. wide, course N. 40° E.
80.00	Set a post, 4 ft. long, 4 ins. square, 2 ft. in the ground, for cor. to secs. 25, 30, 31, and 36, marked—
	T. 25 N., S. 30, on N. E.;
	R. 1 W., S. 31, on S. E.;
	R. 2 W., S. 36, on S. W., and
	S. 25, on N. W. faces, with 5 notches on N. and 1 notch on S. edges; from which
	A birch, 24 ins. diam., bears N. 30° E., 18 lks. dist., marked T. 25 N., R. 1 W., S. 30 B. T.;
	A white oak, 16 ins. diam., bears S. 25° E., 60 lks. dist., marked T. 25 N., R. 1 W., S. 31 B. T.;
	A white oak, 14 ins. diam., bears S. 80° W., 93 lks. dist., marked T. 25 N., R. 2 W., S. 36 B. T.;
	A poplar, 15 ins. diam., bears N. 60° W., 82 lks. dist., marked T. 25 N., R. 2 W., S. 25 B. T.
	From this cor. the old sec. cor., a decayed post, bears E., 30 lks. dist. I destroyed this post, and also the marks on old bearing trees.
	Land, rolling and level.
	Soil, N. and S. parts, rich loam—1st rate; middle part, sandy—2d rate.
	Timber, beech, poplar, white oak, and birch.

	North, bet. secs. 25 and 30.
	Va. 17° 55′ E.
	Through timber.
4.20	A maple, 16 ins. diam.
6.10	Foot of rising ground, slopes E. and N. W.
40.00	An elm, 18 ins. diam., which I mark ¼ S., on W. face, for ¼ sec. cor., from which
	A poplar, 30 ins. diam., bears N. 30° E., 100 lks. dist., marked ¼ S. B. T.
	A beech, 13 ins. diam., bears S. 24° W., 30 lks. dist., marked ¼ S. B. T.
	From this point a post, the old ¼ sec. cor., bears N. 75° E., 100 lks. dist. I destroyed this post, and also marks on the old bearing trees, a beech and poplar.
74.00	A white oak, 16 ins. diam.
80.00	Set a post, 4 ft. long, 4 ins. square, 24 ins. in the ground, for cor. to secs. 19, 24, 25, and 30, marked—
	T. 25 N., S. 19, on N. E.;
	R. 1 W., S. 30, on S. E.;
	R. 2 W., S. 25, on S. W., and
	S. 24, on N. W. faces, with 4 notches on N. and 2 notches on S. edges; from which
	A beech, 18 ins. diam., bears N. 30° E., 74 lks. dist., marked T. 25 N., R. 1 W., S. 19 B. T.
	A poplar, 26 ins. diam., bears S. 40° E., 28 lks. dist., marked T. 25 N., R. 1 W., S. 30 B. T.

Exteriors T. 25 N., R. 2 W.—Continued.

Chains.	
	A burr oak, 16 ins. diam., bears S. 80° W., 36 lks. dist., marked T. 25 N., R. 2 W., S. 25 B. T.;
	A white oak, 16 ins. diam., bears N. 45° W., 36 lks. dist., marked T. 25 N., R. 2 W., S. 24 B. T.
	From this point the old sec. cor., a post, bears N. 50° E., 40 lks. dist. I destroyed this post, and also the marks on old bearing trees.
	Land, rolling.
	Soil, rich loam—1st rate.
	Timber, beech, walnut, elm, and white oak.
	North, bet. secs. 19 and 24.
	Va. 17° 55′ E.
	Through timber, gradually descending.
22.10	A white walnut, 24 ins. diam.
40.00	Set a post, 3 ft. long, 3 ins. square, 2 ft. in the ground, for ¼ sec. cor., marked ¼ S. on W. face; from which
	An ash, 10 ins. diam., bears S. 40° E., 60 lks. dist., marked ¼ S. B. T.;
	An ash, 12 ins. diam., bears N. 6° W., 13 lks. dist., marked ¼ S. B. T.
	From this point the old ¼ sec. cor., a post, bears S. 10 E., 45 lks. dist. I destroyed this post, and also the marks on old bearing trees.
44.00	Foot of slope, about 80 ft. below last sec. cor. Road from Williamsburg to Astoria, course E. and W.
50.00	Elk Creek, 130 lks. wide, shallow at this point, and gentle current, general course W.
56.40	Brook, 10 lks. wide, course S. W.
65.20	Leave creek bottom, and enter upland, course E. and W.
72.00	A hickory, 14 ins. diam.
80.00	Set a granite bowlder, 20 × 12 × 4 ins., 15 ins. in the ground, for cor. to secs. 13, 18, 19, and 24, marked with 3 notches on N. and S. edges, and raised a mound of stone alongside.
	From this point, the old sec. cor., a limestone, bears N. 20° E., 16 lks. dist. I destroyed marks on this stone. Found stumps of trees, which had probably been established as bearing trees at date of original survey, but could not distinguish any marks on same.
	Land, rolling and level.
	Soil, rich loam—1st rate. Bottom is not subject to inundation.
	Timber, walnut, beech, maple, ash, and hickory.
	North, bet. secs. 13 and 18.
	Va. 17° 55′ E.
	Through timber.
12.30	A white oak, 16 ins. diam.
21.00	Foot of high, broken ridge, about 200 ft. above creek bottom, course E. and N. W.
30.40	Top of ridge, about 75 ft. high, descend abruptly.
40.00	Set a limestone, 16 × 10 × 4 ins. 11 ins. in the ground, for ¼ sec. cor., marked ¼ on W. side, from which
	A cherry, 8 ins. diam., bears N. 30° W., 16 lks. dist., marked ¼ S. B. T.
	A cherry, 10 ins. diam., bears S. 60° W., 80 lks. dist., marked ¼ S. B. T.
	I could find no traces of old ¼ sec. cor., but found an old cherry tree marked for bearing tree, and obliterated marks on same.
44.00	A burr oak, 30 ins. diam.
59.00	Foot of descent, about 300 ft. below top of ridge, and ascend.
80.00	Set a post, 4 ft. long, 4 ins. square, 24 ins. in the ground, for cor. to secs. 7, 12, 13, and 18, marked—
	T. 25 N., S. 7, on N. E.;
	R. 1 W., S. 18, on S. E.;
	R. 2 W., S. 13, on S. W., and
	S. 12, on N. W. faces, with 2 notches on N. and 4 notches on S. faces; from which
	A hickory, 18 ins. diam., bears N. 40° E., 14 lks. dist., marked T. 25 N., R. 1 W., S. 7 B. T.;
	A maple, 12 ins. diam., bears S. 42° E., 23 lks. dist., marked T. 25 N., R. 1 W., S. 18 B. T.;

Chains.	
	A beech, 16 ins. diam., bears S. 36° W., 16 lks. dist., marked T. 25 N., R. 2 W. S. 13 B. T.;
	A hickory, 20 ins. diam., bears N. 39° W., 38 lks. dist., marked T. 25 N., R. 1 W. S. 12 B. T.
	The old sec. cor., a post, was lying on the ground near this cor. I destroyed this post. The bearing trees are those described in the field notes of original survey, and were all newly marked.
	Land (except S. 21.00 chs.), high, broken, and mountainous.
	Soil, sandy and rocky—3d and 4th rate.
	Timber, beech, hickory, maple, and black-jack.
	North, bet. secs. 7 and 12.
	Va. 17° 55′ E.
	Through timber.
13.10	A black oak, 16 ins. diam.
40.00	Set a limestone 20 × 8 × 2 ins., 15 ins. in the ground, for ¼ sec. cor., marked ¼ on W. side, from which
	An elm, 14 ins. diam., bears S. 40° W., 16 lks. dist., marked ¼ S. B. T.;
	An elm, 11 ins. diam., bears N. 23° W., 42 lks. dist., marked ¼ S. B. T.
	From this point, the old ¼ sec. cor., a post, bears N. 75° W., 60 lks. dist. I destroyed this post, and also the marks on old bearing trees.
68.00	A point about 100 ft. above last sec. cor., and foot of mountain, course E. N. W.
80.00	A granite rock in place 2 × 6 × 10 ft. above ground, which I marked for cor. to secs. 1, 6, 7, and 12, with a cross (×) at exact cor. point, and 1 notch N. and 5 notches S. of cross.
	This rock is on the top of the mountain about 300 ft. above foot. Fire has destroyed all traces of old sec. cor. and bearing trees.
	Land, mountainous and broken.
	Soil, stony and rocky—4th rate.
	Timber, hickory, oak, beech, and ash.
	The fire above referred to was confined to a space of about 30 acres on the summit of the mountain.
	North, bet. secs 1 and 6.
	Va. 17° 55′ E.
	Descend abruptly.
6.00	A black oak, 16 ins. diam., and enter timber.
9.00	A point about 250 feet below summit; foot of mountain.
20.13	An ash, 12 ins. diam.
34.06	An ash, 20 ins. diam.
39.00	Edge of ravine, about 40 ft. deep.
40.00	Bottom of ravine, and set a limestone 18×7×4 ins., 12 ins. in the ground, for ¼ sec. cor., marked ¼ on W. side, from which
	A poplar, 16 ins. diam., bears N. 40° E., 34 lks. dist., marked ¼ S. B. T.;
	A poplar, 14 ins. diam., bears S. 13° W., 22 lks. dist., marked ¼ S. B. T.
	From this point the old ¼ sec. cor., a post bears S. 80° W., 10 lks. dist. I destroyed this post, and after a careful examination of all the trees within limits, was unable to distingnish any marks made for bearing trees.
44.10	Leave timber, and enter open prairie, course E. and N. W.
79.75	At this point I found the old township cor., a charred stake with remains of trench and mound. As Tps. 26 N., Rs. 1 and 2 W., had both been subdivided, I could not change the location of this cor. and therefore re-established it, as follows:
	Set a post, 4½ ft. long, 4 ins. square, 24 ins. in the ground, for cor. to Tps. 25 and 26 N., Rs. 1 and 2 W., marked—
	T. 26 N. S. 31 on N. E.;
	R. 1 W. S. 6 on S. E.;
	T. 25 N. S. 1 on S. W.; and
	R. 2 W. S. 36 on N. W. faces, with 6 notches on each edge; from which
	A cherry, 6 ins. diam., bears N. 40° E., 14 lks. dist., marked T. 26 N., R. 1 W. S. 31 B. T.;

Chains.	
	A white oak, 5 ins. diam., bears S. 30° E., 24 lks. dist., marked T. 25 N., R. 1 W., S. 6 B. T.;
	A hickory, 8 ins. diam., bears S. 50° W., 30 lks. dist., marked T. 25 N., R. 2 W., S. 1 B. T.;
	A chestnut, 6 ins. diam. bears N. 28° W., 13 lks. dist., marked T. 26 N., R. 2 W., S. 36 B. T.
	Land, broken, rolling, and level.
	Soil, rocky and sandy loam—2d and 4th rate.
	Timber, oak, ash, poplar, chestnut, and hickory.
	In subdividing this township, and running the random line west bet. secs. 7 and 18, I was unable to find the cor. to secs. 7, 12, 13, and 18. I found the ¼ sec. cor. bet. secs. 13 and 18, which is
	A post, 3 ins. square, firmly set in the ground, and marked ¼ S. on W. side; from which
	A white oak, 27 ins. diam., bears N. 27° W., 27 lks. dist., marked ¼ S. B. T.;
	A white oak, 30 ins. diam., bears N. 28° E., 92 lks. dist., marked ¼ S. B. T.
	From this ¼ sec. cor. I run north bet. secs. 13 and 18.
	Va. 18° E.
6.50	Road from Williamsburg, course E. and W.
38.00	Fence, course E. and W., leave timber, and enter plowed ground.
40.00	At this point I again made careful search for the sec. cor., which is described as a post, with bearing trees, but was unable to find any traces of it, and therefore re-established cor. as follows:
	Set a post 4 ft. long, 4 ins. square, with marked stone, 12 ins. in the ground, for cor. to secs. 7, 12, 13, and 18, marked—
	T. 25 N. S. 7 on N. E.;
	R. 2 W. S. 18 on S. E.;
	R. 3 W. S. 13 on S. W. and
	S. 12 on N. W. faces, with 2 notches on N. and 4 notches on S. edges; dug pits 18 × 18 × 12 ins. in each sec., 5½ ft. dist., and raised a mound of earth 2 ft. high, 4½ ft. base, around post.
	Land, level.
	Soil, rich loam—1st rate.
	Timber, oak.

SPECIMEN FIELD NOTES.

No. 5.

TITLE PAGE.

FIELD NOTES

OF THE SURVEY OF THE

SUBDIVISION AND MEANDER LINES

OF

TOWNSHIP No. 6 NORTH, RANGE No. 34 EAST,

OF THE

PRINCIPAL BASE AND MERIDIAN

OF

MONTANA TERRITORY,

AS SURVEYED BY

WALTER W. de LACY,
U. S. DEPUTY SURVEYOR,

UNDER HIS CONTRACT,

No. 87,

DATED JULY 3, 1880.

Survey commenced August 6th, 1880.
Survey completed August 16th, 1880.

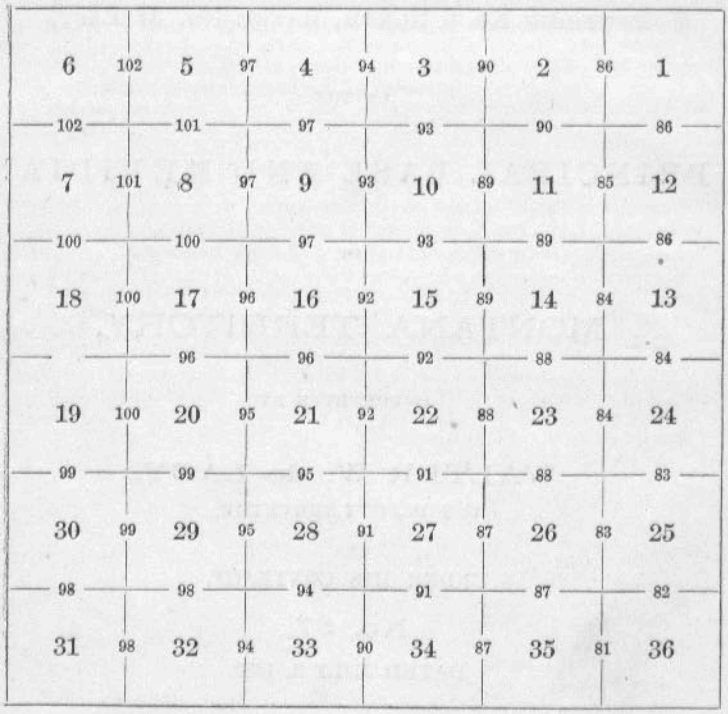
[Second page.]

NAMES AND DUTIES OF ASSISTANTS.

——— ——— .....Compassman.
WILLIAM MORAN .....Chainman.
PETER COOPER .....Chainman.
ARTHUR F. FOWLER .....Axeman.
FRANKLIN J. SAGE.....Axeman.
JOHN PARKER .....Flagman.

INDEX.

Township 25 north. R. 2 west.



PRELIMINARY OATHS OF ASSISTANTS.

We, William Moran and Peter Cooper, do solemnly swear that we will well and faithfully execute the duties of chain carriers; that we will level the chain over even and uneven ground, and plumb the tally pins either by sticking or dropping the same; that we will report the true distance to all notable objects, and the true lengths of all lines that we assist in measuring, to the best of our skill and ability, and in accordance with instructions given us in the survey of the subdivision and meander lines of Township No. 6 north, of Range No. 34 east, of the principal base and meridian in the Territory of Montana.

WILLIAM MORAN, *Chainman.*
PETER COOPER, *Chainman.*

Subscribed and sworn to before me this second day of August, 1880.

JOHN JENKINS,
Notary Public.

[SEAL.]

We, Arthur F. Fowler and Franklin J. Sage, do solemnly swear that we will well and truly perform the duties of axmen in the establishment of corners and other duties, according to instructions given us, and to the best of our skill and ability, in the survey of the subdivision and meander lines of Township No. 6 north, of Range No. 34 east, of the principal base and meridian in the Territory of Montana.

ARTHUR F. FOWLER, *Axeman.*
FRANKLIN J. SAGE, *Axeman.*

Subscribed and sworn to before me this second day of August, 1880.

[SEAL.]

JOHN JENKINS,
Notary Public.

T. 6 N., R. 34 E.

Chains.	
	Preliminary to commencing this survey, I ran west on a blank line on the south boundary of Sec. 36, and at 39.97 chs. found the ¼ sec. cor. and at 80.01 chs. found the sec. cor. As the east boundary of Sec. 31 crosses the Yellowstone River it was not re-run. My compass will therefore run the same line as the exterior boundaries, and the chaining practically agrees.
	Survey commenced August 6, 1879, with a Burt's improved solar compass.
	I commenced at the cor. to Secs. 1, 2, 35, and 36, on the south boundary, which is a sandstone 30×8×2½ ins. firmly set in the ground, with one notch on E. and 5 notches on W. edges, and pits 18×18×12 ins. in each sec. 5½ ft. dist. with mound of earth 2 ft. high, 4½ ft. base alongside. Thence I run North bet. Secs. 35 and 36.
	Va. 18° 30′ E.
20.00	Enter scattering timber. Alexander's house bears N. 31° W.
31.00	Leave scattering timber.
40.00	Set a post 3 ft. long, 3 ins. square, with marked stone, 12 ins. in the ground, for ¼ sec. cor., marked ¼ S. on W. side, dug pits 18 × 18 × 12 ins. N. and S. of post, 5½ ft. dist., and raised a mound of earth 1½ ft. high, 3½ ft. base, around post.
	Alexander's house bears S. 53¾° W.
52.70	Enter brush.
53.82	Right bank of the Yellowstone River. Set a post 4 ft. long, 4 ins. square, with marked stone, 12 ins. in the ground, for meander cor. to fractional secs. 35 and 36, marked M. C., and T. 6 N. on S., R. 34 E. S. 36 on E., and S. 35 on W., faces, dug pit 3 ft. square, 12 ins. deep, 8 lks. S. of post, and raised mound of earth 2 ft. high, 4½ ft. base, around post.
	There being an island on line on N. side of channel, I send a flag across, and set it on line bet. secs. 35 and 36, on bar S. of island. I then go across to flag and run a base line W. 11.14 chs., to a point from which meander cor. on right bank bears S. 37° 50′ E., which gives for distance across the river to edge of bar 14.34 chs. I then run north from flag 66 lks. to south bank of island, making the whole distance 53.82 + 14.34 + 0.66 chs., or

Chains.	
68.82	To south bank of island, which point I established by setting a post 4 ft. long, 4 ins. square, with marked stone, 12 ins. in the ground, for meander cor. to fractional secs. 35 and 36 on S. bank of island, marked M. C., and T. 6 N. on N., R. 34 E. S. 36 on E., and S. 35 on W., faces, dug pit 3 ft. square, 12 ins. deep, 8 lks. N. of post, and raised a mound of earth 2 ft. high, 4½ ft. base, around post.
	Thence continue on line across island, enter brush.
72.50	Leave brush, enter timber.
80.00	Set a post 4 ft. long, 4 ins. square, with marked stone, 12 ins. in the ground, for cor. to secs. 25, 26, 35, and 36, marked T. 6 N. S. 25 on N. E., R. 34 E. S. 36 on S. E., S. 35 on S. W., and S. 26 on N. W., faces, with 1 notch on S. and E. edges, from which A cottonwood, 12 ins. diam., bears N. 12¾° E., 180 lks. dist., marked T. 6 N., R. 34 E., S. 25 B. T. A cottonwood, 18 ins. diam., bears S. 82° E., 154 lks. dist., marked T. 6 N., R. 34 E., S. 36 B. T. A cottonwood, 10 ins. diam., bears S. 29½° W., 56 lks. dist., marked T. 6 N., R. 34 E., S. 35 B. T. A cottonwood, 10 ins. diam., bears N. 46½° W., 119 lks. dist., marked T. 6 N., R. 34 E., S. 26 B. T.
	Land, level. Soil, rich loam—1st rate. Timber, cottonwood and willow undergrowth same, 12.30 chains.

	East, on a random line, bet. secs. 25 and 36. Va. 18° 20′ E.
	This line is wholly on the island.
1.33	A cottonwood, 20 ins. diam.
21.50	Leave timber.
31.00	Enter timber and brush.
35.00	Leave timber and brush.
40.00	Set temporary ¼ sec. cor.
47.50	Enter timber.
53.00	Leave timber.
61.00	Enter brush.
66.00	Leave brush, enter scattering timber.
79.54	Intersect the east boundary of the township at 58 lks. N. of the cor. to secs. 25, 30, 31, and 36, which is a post 4 ft. long, 4 ins. square, firmly set in the ground, marked T. 6 N. S. 30 on N. E., R. 35 E. S. 31 on S. E., R. 34 E. S. 36 on S. W., and S. 25 on N. W., faces, with 5 notches on N. and 1 notch on S. edges, from which A cottonwood, 20 ins. diam., bears N. 36½° E., 166 lks. dist., marked T. 6 N., R. 35 E., S. 30 B. T. A cottonwood, 24 ins. diam., bears S. 39° E., 67 lks. dist., marked T. 6 N., R. 35 E., S. 31 B. T. A cottonwood, 14 ins. diam., bears S. 89½° W., 170 lks. dist., marked T. 6 N., R. 34 E., S. 36 B. T. A cottonwood, 16 ins. diam., bears N. 23° W., 40 lks. dist., marked T. 6 N., R. 34 E., S. 25 B. T.
	Thence I run N. 89° 35′ W. on a true line, bet. secs. 25 and 36, with same va.
39.77	Set a post 3 ft. long, 3 ins. square, with marked stone, 12 ins. in the ground for ¼ sec. cor., marked ¼ S. on N. face, dug pits 18 × 18 × 12 ins. E. and W. of post, 5½ ft. dist., and raised a mound of earth 1½ ft. high, 3½ ft. base, around post.
79.54	The cor. to secs. 25, 26, 35 and 36. Land, level.

Subdivisions, T. 6 N., R. 34 E.—Continued.

Chains.	
	Soil, alluvial—1st rate. Timber, cottonwood and willow, undergrowth same, 36.50 chs. *August* 6, 1880.
	As the line bet. secs. 26 and 35 is fractional, I run West, on a true line, bet. secs. 26 and 35. Va. 18° 20′ E.
3.50	Leave timber.
4.83	West bank of island on river. Set a sandstone, 12 × 12 × 5 ins., 8 ins. in the ground, for meander cor. to fractional secs. 26 and 35, marked M. C., from which a double cottonwood, 16 ins. diam., bears N. 78° E., 157 lks. dist., marked T. 6 N., R. 34 E., S. 26 M. C. B. T. A cottonwood, 18 ins. diam., bears S. 29½° W., 140 lks. dist., marked T. 6 N., R. 34 E., S. 35 M. C. B. T. NOTE.—The remainder of this line was run east from cor. to secs. 26, 27, 34, and 35.
	I now return to the cor. to secs. 25, 26, 35, and 36, whence I run North bet. secs. 25 and 26, Va. 18° 20′ E. Through timber and brush.
3.64	North bank of island on river. Set a post 4 ft. long, 4 ins. square, with marked stone, 12 ins. in the ground, for meander cor. to fractional secs. 25 and 26, marked M. C., and T. 6 N. on N., R. 34 E. S. 25 on E., and S. 26 on W., faces; from which A cottonwood, 8 ins. diam., bears S. 52¼° E., 58 lks. dist., marked T. 6 N., R. 34 E., S. 25 M. C. B. T. A cottonwood, 10 ins. diam., bears S. 31° W., 103 lks. dist., marked T. 6 N., R. 34 E., S. 26 M. C. B. T.
	From this meander cor. on island I run north on bar 3.60 chs. to water's edge, and send flag across to left bank of river, and set it on line bet. secs. 25 and 26. I then run a base line east on bar 3.00 chs. to a point whence flag bears N. 55½° W., which gives for distance across 2.08 chs. by calculation. The whole distance from cor. to secs. 25, 26, 35, and 36 will therefore be 3.64 + 3.60 + 2.08 chs., making
9.32	To flag on left bank. This point I establish by setting a sandstone, 22 × 10 × 5 ins., 16 ins. in the ground, for meander cor. to fractional secs. 25 and 26, marked M. C., and raised a mound of stone alongside. Thence I run north on line, over level bottom.
40.00	Set a sandstone, 16 × 14 × 4 ins. 11 ins. in the ground, for ¼ sec. cor., marked ¼ on W. face, dug pits 18 × 18 × 12 ins. N. and S. of stone, 5½ ft. dist., and raised a mound of earth, 1½ ft. high, 3½ ft. base, alongside.
60.30	Telegraph line, course S. 55° E.
78.20	Road to Miles City.
80.00	Set a sandstone, 36 × 8 × 5 ins., 25 ins. in the ground, for cor. to secs. 23, 24, 25, and 26, marked with 2 notches on S. and 1 notch on E. edges; dug pits 18 × 18 × 12 ins. in each sec., 5½ ft. dist., and raised a mound of earth 2 ft. high, 4½ ft. base, alongside. Land, level. Soil, alluvial bottom—1st rate. Timber, cottonwood on island, 3.64 chs.
	East, on a random line, bet. secs. 24 and 25. Va. 18° 30′ E.
22.80	Short creek, spring water, 3 lks. wide, course S. E. Spring bears N. 20° W., about 5.00 chs. dist.
37.60	Stage station (Fletcher's) bears S. 41¼° E.
40.00	Set temporary ¼ sec. cor.
44.20	Fletcher's stage station bears S. 24° E.

Subdivisions, T. 6 N., R. 34 E.—Continued.

Chains.	
79.90	Intersect east boundary of township 68 lks. N. of cor. to secs. 19, 24, 25, and 30, which is a post, 4 ins. square, marked T. 6 N. S. 19 on N. E., R. 35 E. S. 30 on S. E., R. 34 E. S. 25 on S. W., and S. 24 on N. W. faces, with 4 notches on N. and 2 notches on S. edges, and pits 18 × 18 × 12 ins. in each sec., 5½ ft. dist., and mound of earth 2 ft. high, 4½ ft. base, around post.
	Thence I run
	N. 89° 31′ W., on a true line, bet. secs. 24 and 25, with same va.
39.95	Set a sandstone, 22 × 10 × 3 ins., 16 ins. in the ground, for ¼ sec. cor., marked ¼ on N. face, and raised a mound of stone alongside.
79.90	The cor. to secs. 23, 24, 25, and 26.
	Land, level.
	Soil, alluvial bottom; 1st rate.
	No timber.

North, bet. secs. 23 and 24.
Va. 18° 30′ E.
Over nearly level ground.

21.00	Enter alkali flat.
40.00	Set a post 3 ft. long, 3 ins. square, with marked stone, 12 ins. in the ground, for ¼ sec. cor., marked ¼ S. on W. face; dug pits 18 × 18 × 12 ins. N. and S. of post, 5½ ft. dist., and raised a mound of earth 1½ ft. high, 3½ ft. base, around post.
73.71	Alkali creek, dry, course E.
75.00	Leave alkali flat.
80.00	Set a sandstone 16 × 10 × 4 ins., 11 ins. in the ground, for cor. to secs. 13, 14, 23, and 24, marked with 3 notches on S. and 1 notch on E. edges; dug pits 18 × 18 × 12 ins. in each sec., 5½ ft. dist., and raised a mound of earth 2 ft. high, 4½ ft. base, alongside.
	Land, gently rolling and level.
	Soil, partly alluvial and alkali; 1st and 3d rate.
	A few scattering cottonwoods on creek.

East, on a random line, bet. secs. 13 and 24.
Va. 18° 30′ E.
Over sage brush plain.

38.50	Left bank of Alkali Creek, dry, course N. E., thence in creek.
40.00	Set temporary ¼ sec. cor.
42.00	Leave creek, course S. E., thence over level ground.
79.80	Intersect east boundary of township 60 lks. north of cor. to secs. 13, 18, 19, and 24, which is a sandstone 20 × 8 × 4 ins., 15 ins. in the ground, marked with 3 notches on N. and S. edges, and mound of stone alongside.
	Thence I run
	N. 89° 34′ W., on a true line, bet. secs. 13 and 24, with same va.
39.90	The corner point being in creek, at a point 30 lks. N. on N. bank of creek, I set a post 3 ft. long, 3 ins. square, with marked stone, 12 ins. in the ground, for witness cor. to ¼ sec. cor., marked W. C. ¼ S. on N. face, dug pits 18 × 18 × 12 ins. E. and W. of post, 5½ ft. dist., and raised a mound of earth, 1½ ft. high, 3½ ft. base, around post.
79.80	The cor. to secs. 13, 14, 23, and 24.
	Land, level.
	Soil, alkali, and sandy loam—2d rate.
	A few scattering cottonwoods on creek.

August 7, 1880.

North, bet secs. 13 and 14.
Va. 18° 45′ E.

34.00	Leave bottom and ascend.
36.00	Top of bench about 50 ft. high, course N. E., thence over gently rolling ground.

Chains.	
40.00	Deposited a marked stone, 12 ins. in the ground, for ¼ sec. cor., dug pits 18×18×12 ins. N. and S. of cor., 5½ ft. dist., and raised a mound of earth 1½ ft. high, 3½ ft. base, over it. In N. pit drove stake 2 ft. long, 2 ins. square, 12 ins. in the ground, marked ¼ S. on W. face.
68.00	Foot of bluff, about 150 ft. high, course E., and ascend.
72.70	Top of bluff, enter pine timber, and thence descend along rocky slope, sloping westerly to
80.00	A point about 100 ft. below top of bluff. This point falling on a flat rock in place I mark a cross (×) at exact cor. point, for cor. to secs. 11, 12, 13, and 14, with 4 notches S. and 1 notch E., and raised a mound of stone alongside. Pits impracticable.
	From corner point
	A pine, 10 ins. diam., bears N. 15° E., 27 lks. dist., marked T. 6 N., R 34 E., S. 12 B. T.
	A pine, 10 ins. diam., bears S. 42° E., 46 lks. dist., marked T. 6 N., R. 34 E., S. 13 B. T.
	A pine, 6 ins. diam., bears S. 5° W., 86 lks. dist., marked T. 6 N., R. 34 E., S. 14 B. T.
	A pine, 9 ins. diam., bears N. 15° W., 90 lks. dist., marked T. 6 N., R. 34 E., S. 11 B. T.
	Land, 34 chs. bottom, remainder broken.
	Soil, alluvial and rocky—1st and 4th rate.
	Timber, pine 7.30 chains.

	East, on a random line, bet. secs. 12 and 13.
	Va. 18° 30′ E.
	Ascend.
5.00	Top of ridge, about 125 ft. high, course S. Leave timber, thence over rolling ground to
14.00	Commence descending.
23.00	Couleé, 100 ft. deep, course S. E., thence ascend.
28.00	E. side of couleé, thence over rolling ground.
40.00	Set temporary ¼ sec. cor.
41.70	Couleé, about 30 ft. deep, course S. W.
80.00	Intersect E. boundary of township, 70 lks. N. of cor., to secs. 7, 12, 13, and 18, which is a post, 4 ins. square, marked
	T. 6 N. S. 7 on N. E.,
	R. 35 E. S. 18 on S. E.,
	R. 34 E. S. 13 on S. W., and
	S. 12 on N. W. faces, with 2 notches on N. and 4 notches on S. edges, and mound of stone, 2 ft. high, 4½ ft. base, around post.
	Thence I run
	N. 89° 30′ W., on a true line, bet. secs. 12 and 13, with same va.
40.00	Set a post, 3 ft. long, 3 ins. square, with marked stone, 12 ins. in the ground, for ¼ sec. cor., marked ¼ S. on N. face, and raised a mound of stone alongside.
80.00	The cor. to secs. 11, 12, 13, and 14.
	Land, rolling and broken.
	Soil, stony—4th rate.
	Timber, pine—5 chs.

	North, bet. secs. 11 and 12.
	Va. 18° 30′ E.
	Ascend along west side of hill, through timber.
8.00	Top of table land, about 30 ft. above last cor., and leave timber, thence over rolling ground.
40.00	Deposited a marked stone 12 ins. in the ground, for ¼ sec. cor., dug pits 18×18×12 ins. N. and S. of cor., 5½ ft. dist., and raised a mound of earth, 1½ ft. high, 3½ ft. base, over it. In N. pit drove stake 2 ft. long, 2 ins. square, 12 ins. in the ground, marked ¼ S. on W. face.
61.10	Stream, 6 lks. wide, course E.

Subdivisions, T. 6 N., R. 34 E.—Continued.

Chains.	
80.00	Set a sand stone 20 × 6 × 4 ins., 15 ins. in the ground, for cor. to secs. 1, 2, 11, and 12, marked with 5 notches on S. and 1 notch on E. edges, dug pits 18 × 18 × 12 ins. in each sec., 5½ ft. dist., and raised a mound of earth, 2 ft. high, 4½ ft. base, alongside.
	Land, rolling.
	Soil, sandy—3d rate.
	Timber, pine, 8 chs.
	East, on a random line, bet. secs. 1 and 12.
	Va. 18° 30′ E.
5.00	Commence descending.
9.00	Enter pine timber.
21.60	Couleé, about 100 ft. deep, course N. W.
30.00	Couleé, about 15 ft. deep, course N. E.
38.00	Couleé, about 18 ft. deep, course N. E.
40.00	Set temporary ¼ sec. cor.
49.00	Couleé, about 12 ft. deep, course N. E., ascend about 75 ft. to
65.00	Top of ridge, course N. E.
67.00	Descend
69.00	Foot of ridge, about 100 ft. below top, and leave timber.
80.10	Intersect E. boundary of township at 42 lks. N. of cor. to secs. 1, 6, 7, and 12, which is a sandstone 20 × 4 × 3 ins., 15 ins. in the ground, marked with 1 notch on N. and 5 notches on S. edges, and mound of stone alongside.
	Thence I run
	N. 89° 42′ W., on a true line, bet. secs. 1 and 12, with same va.
40.05	Set a sandstone 18 × 14 × 3 ins., 12 ins. in the ground, for ¼ sec. cor., marked ¼ on N. face; from which
	A pine, 8 ins. diam., bears S. 31° E., 95 lks. dist., marked ¼ S. B. T.
	A pine, 12 ins. diam., bears N. 25° W., 25 lks. dist., marked ¼ S. B. T.
80.10	The cor. to secs. 1, 2, 11, and 12.
	Land, rolling and broken.
	Soil, sandy and rocky—3d and 4th rate.
	Timber, pine, of excellent quality—60 chs.
	North, on a random line, bet. secs. 1 and 2.
	Va. 18° 30′ E.
	Over rolling ground.
40.00	In couleé, about 20 ft. deep, course S. E.
	Set temporary ¼ sec. cor.
49.00	Couleé, about 15 ft. deep, course S. E.
60.00	Couleé, about 20 ft. deep, course S. E.
79.77	Intersect north boundary of township at 45 lks. west of cor. to secs. 1, 2, 35, and 36, which is a sandstone 20 × 8 × 4 ins., firmly set in the ground, with pits 18 × 18 × 12 ins. in each sec., 5½ ft. dist., and mound of earth 2 ft. high, 4½ ft. base, alongside.
	Thence I run
	S. 0° 19′ W., on a true line, bet. secs. 1 & 2, with same va.
39.77	A pine, 7 ins. diam., which I marked ¼ S. on W. face, for ¼ sec. cor., dug pits, 18 × 18 × 12 ins., N. and S. of tree, 5½ ft. dist., and raised a mound of earth around tree.
79.77	The cor. to secs. 1, 2, 11, and 12.
	Land, rolling.
	Soil, sandy and alkali—3d rate.
	Timber, scattering pines in couleés.
	August 10, 1880.
	From the cor. to secs. 2, 3, 34, and 35, on the south boundary of the township, which is a post, 4 ins. square, marked
	T. 6 N. S. 35 on N. E.,
	R. 34 E. S. 2 on S. E.,

Chains.

T. 5 N. S. 3 on S. W., and
S. 34 on N. W., faces, with 2 notches on E. and 4 notches on W. edges, and mound of stone, 2 ft. high, 4½ ft. base, around post; I run
North, bet. secs. 34 and 35.
Va. 18° 30′ E.
Over level bottom.

40.00 Set a sandstone, 24 × 14 × 3 ins., 18 ins. in the ground, for ¼ sec. cor., marked ¼ on W. face, dug pits 18 × 18 × 12 ins. N. and S. of stone, 5½ ft. dist., and raised a mound of earth 1½ ft. high, 3½ ft. base, alongside.

80.00 Set a post 4 ft. long, 4 ins. square, with marked stone, 12 ins. in the ground, for cor. to secs. 26, 27, 34, and 35, marked
T. 6 N. S. 26 on N. E.,
R. 34 E. S. 35 on S. E.,
S. 34 on S. W., and
S. 27 on N. W. faces, with 1 notch on S. and 2 notches on E. edges, dug pits 18 × 18 × 12 ins. in each sec., 5½ ft. dist., and raised a mound of earth, 2 ft. high, 4½ ft. base, alongside.
Land, level.
Soil, alluvial bottom—1st rate.
No timber.

As a portion of the line bet. secs. 26 and 35 has been run west from the cor. to secs. 25, 26, 35, and 36, I run
East, on a true line, bet. secs. 26 and 35.
Va. 18° 30′ E.
Over level bottom.

40.00 Deposited a marked stone, 12 ins. in the ground, for ¼ sec. cor., dug pits 18 × 18 × 12 ins. E. and W. of cor., 5½ ft. dist., and raised a mound of earth 1½ ft. high, 3½ ft. base, over it. In E. pit drove a stake 2 ft. long, 2 ins. square, 12 ins. in the ground, marked ¼ S. on N. face.

69.30 Left bank of Yellowstone River. Set a sandstone 20 × 10 × 6 ins., 15 ins. in the ground, for meander cor. to fractional secs. 26 and 35, marked M. C., and raised a mound of stone alongside.

In order to get the distance across the river I run north 20 lks. to a point west of meander cor. on island on this line. I then run a base line south 3.00 chs. to a point whence meander cor. on island bears N. 65° E., which gives for distance, by calculation, 6.43 chs.

The length of the line bet. secs. 26 and 35 is as follows:

East of arm of river, on island	4.83 chs.
Across river	6.43 "
West of river, on main land	60.30 "
Total	80.56 "

Land, level.
Soil, alluvial bottom—1st rate.
Timber, cottonwood, 3.50 chs. on island.

I now return to the cor. to secs. 26, 27, 34, and 35, and run
North, bet. secs. 26 and 27.
Va. 18° 30′ E.
Over gently rolling ground.

26.30 Telegraph line, course N. E.

40.00 Set a post 3 ft. long, 3 ins. square, with marked stone, 12 ins. in the ground, for ¼ sec. cor., marked ¼ S. on W. face; dug pits 18 × 18 × 12 ins. N. and S. of post, 5½ ft. dist., and raised a mound of earth 1½ ft. high, 3½ ft. base, around post.

48.70 Spring branch 1 lk. wide, course S. 80° E.
From this point a spring of pure, cold water, about 2 ft. diam., bears N. 70° W., 2.36 chs. dist.

57.40 Road to Miles City, course N. E.

Subdivisions, T. 6 N., R. 34 E.—Continued.

Chains.	
80.00	Set a post 4 ft. long, 4 ins. square, with marked stone, 12 ins. in the ground, for cor. to secs. 22, 23, 26, and 27, marked— T. 6 N. S. 23 on N. E., R. 34 E. S. 26 on S. E., S. 27 on S. W., and S. 22 on N. W. faces, with 2 notches on S. and E. edges; dug pits 18 × 18 × 12 ins. in each sec., 5½ ft. dist., and raised a mound of earth 2 ft. high, 4½ ft. base, around post. Land, gently rolling. Soil, sandy—2d rate. No timber.
	East, on a random line, bet. secs. 23 and 26. Va. 18° 30′ E. Over gently rolling ground.
27.00	Road to Miles City, course N. E.
40.00	Set temporary ¼ sec. cor.
78.40	Road to Miles City, course S. 50° E.
80.00	Intersect N. and S. line 37 lks. S. of cor. to secs. 23, 24, 25, and 26. Thence I run S. 89° 44′ W., on a true line, bet. secs. 23 and 26, with same va.
40.00	Set a sandstone 14 × 10 × 6 ins., 9 ins. in the ground, for ¼ sec. cor., marked ¼ on N. side, dug pits 18 × 18 × 12 ins. N. and S. of stone, 5½ ft. dist., and raised a mound of earth 1½ ft. high, 3½ ft. base, alongside.
80.00	The cor. to secs. 22, 23, 26, and 27. Land, gently rolling. Soil, sandy—2d rate. No timber.
	North, bet. secs. 22 and 23. Va. 18° 45′ E. Over rolling ground.
40.00	Deposited a marked stone 12 ins. in the ground, for ¼ sec. cor., dug pits 18 × 18 × 12 ins. N. and S. of cor., 5½ ft. dist., and raised a mound of earth 1½ ft. high, 3½ ft. base, over it. In N. pit drove stake 2 ft. long, 2 ins. square, 12 ins. in the ground, marked ¼ S. on W. face. Thence ascend to
56.00	Top of table land, about 40 ft. above ¼ sec. cor.
64.30	Old Military Road, course S. E.
80.00	Set a sandstone 20 × 14 × 3 ins., 15 ins. in the ground, for cor. to secs. 14, 15, 22, and 23, marked with 3 notches on S. and 2 notches on E. edges, dug pits 18 × 18 × 12 ins. in each sec., 5½ ft. dist., and raised a mound of earth 2 ft. high, 4½ ft. base, alongside. Land, rolling and table. Soil, sandy—2d rate. No timber.
	East, on a random line, bet. secs. 14 and 23. Va. 18° 35′ E. Over nearly level table land.
9.20	Old military road, course S.
40.00	Set temporary ¼ sec. cor.
61.00	Descend from table land to
70.50	Alkali creek, dry, course S. E., about 30 ft. below top of table land.
79.84	Intersect N. and S. line 14 lks. S. of cor. to secs. 13, 14, 23, and 24. Thence I run S. 89° 54′ W., on a true line, bet. secs. 14 and 23, with same va.
39.92	Set a sandstone, 18 × 12 × 4 ins., 12 ins. in the ground, for ¼ sec. cor., marked ¼ on N. face, and raised a mound of stone alongside.
79.84	The cor. to secs. 14, 15, 22, and 23. Land, table. Soil, sandy—2d and 3d rate. No timber.

August 9, 1880.

Subdivisions, T. 6 N., R. 34 E.—Continued.

Chains.	
	North, bet. secs. 14 and 15. Va. 18° 35′ E.
11.00	Enter pine timber and ascend to
22.00	Top of small hill, about 30 ft. high, and nearly conical in shape. Descend to
31.00	Foot of hill, and leave timber.
34.00	Old military road, four wagon tracks, course N. W.
40.00	Set a sandstone, 15 × 15 × 3 ins., 10 ins. in the ground, for ¼ sec. cor., marked ¼ on W. face, dug pits 18 × 18 × 12 ins. N. and S. of stone, 5½ ft. dist., and raised a mound of earth 1½ ft. high, 3½ ft. base, alongside.
41.80	Commence ascending.
43.90	Top of table land, about 50 ft. above last ¼ sec. cor. Thence over nearly level land to
80.00	Set a post, 4 ft. long, 4 ins. square, with marked stone, 12 ins. in the ground, for cor. to secs. 10, 11, 14, & 15, marked— T. 6 N. S. 11 on N. E., R. 34 E. S. 14 on S. E., S. 15 on S. W., and S. 10 on N. W. faces, with 4 notches on S. and 2 notches on E. edges, dug pits 18 × 18 × 12 ins. in each sec., 5½ ft. dist., and raised a mound of earth, 2 ft. high, 4½ ft. base, around post.
	Land, rolling and table.
	Soil, sandy and gravelly—3d rate.
	Timber, pine—20.00 chs.
	East, on a random line, bet. secs. 11 and 14. Va. 18° 30′ E.
	Gradually ascending.
40.00	Set temporary ¼ sec. cor.
66.00	Point about 60 ft. above last sec. cor., foot of nearly perpendicular bluff, course N. and S., and enter scattering pine timber.
68.20	Top of bluff, about 75 ft. high.
80.06	Intersect N. & S. line, 50 lks. N. of cor. to secs. 11, 12, 13, and 14. Thence I run N. 89° 39′ W., on a true line, bet. secs. 11 and 14, with same va.
40.03	Deposited a marked stone, 12 ins. in the ground, for ¼ sec. cor., dug pits 18 × 18 × 12 ins. E. and W. of cor., 5½ ft. dist., and raised a mound of earth 1½ ft. high, 3½ ft. base, over it. In E. pit drove stake 2 ft. long, 2 ins. square, 12 ins. in the ground, marked ¼ S. on N. face.
80.06	The cor. to secs. 10, 11, 14, and 15. Land, table and broken. Soil, gravelly—3d rate. Timber, scattering pine.
	North, bet. secs. 10 and 11. Va. 18° 30′ E.
	Over table land.
26.00	Foot of spur of high mountain, ascend abruptly over broken ground.
34.00	Head of ravine, course S. 70° E.
40.00	Set a sandstone 20 × 8 × 4 ins., 15 ins. in the ground, for ¼ sec. cor., marked ¼ on W. face, and raised a mound of stone alongside.
42.00	Foot of sharp ridge, course E. and W.
43.25	Top of ridge, about 40 ft. high, and about 500 ft. above last sec. cor. Descend abruptly.
44.00	Foot, about 30 ft. below top, and ascend over broken ground.
51.10	Enter heavy pine timber.
80.00	A point about 900 ft. above last sec. cor. Set a sandstone 24 × 6 × 4 ins., 18 ins. in the ground, for cor. to secs. 2, 3, 10, and 11, marked with 5 notches on S. and 2 notches on E. edges, from which A pine, 15 ins. diam., bears N. 67° E. 30 lks. dist., marked T. 6 N., R. 34 E., S. 2 B. T. A pine, 27 ins. diam., bears S. 23° E. 67 lks. dist., marked T. 6 N., R. 34 E., S. 11 B. T. A pine, 12 ins. diam., bears S. 47° W. 110 lks. dist., marked T. 6. N., R. 34 E., S. 10 B. T.

Chains.	
	A pine, 16 ins. diam., bears N. 50° W., 82 lks. dist., marked T. 6 N., R. 34 E., S. 3 B. T.
	Land, mountainous and broken.
	Soil, rocky—4th rate.
	Timber, pine—28.90 chs.
	54.00 chs. of line runs over mountainous land.
	East, on a random line, bet. secs. 2 and 11. Va. 18° 30′ E.
	Over rough, broken ground, through timber.
12.00	Descend into deep ravine, course S. 20° E.
18.30	Bottom of ravine, about 100 ft. deep, and ascend.
21.10	Across ravine.
24.35	Descend abruptly.
40.00	Set temporary ¼ sec. cor.
61.10	Stream 4 lks. wide, course S. E., and leave timber.
72.08	Foot of spur, thence over rolling ground.
80.00	Intersected N. and S. line at 48 lks. S. of cor. to secs. 1, 2, 11 and 12. Thence I run
	S. 89° 39′ W., on a true line, bet. secs. 2 and 11, with same va.
40.00	Set a sandstone, 16 × 5 × 4 ins., 11 ins. in the ground, for ¼ sec. cor., marked ¼ on N. face, from which
	A pine, 18 ins. diam., bears N. 17° E., 48 lks. dist., marked ¼ S. B. T.
	A pine, 14 ins. diam., bears N. 40 W., 63 lks. dist., marked ¼ S. B. T.
80.00	The cor. to secs. 2, 3, 10, and 11.
	Land, mountainous and broken.
	Soil, rocky—4th rate.
	Timber, pine—61.10 chs.
	72.08 chs. of line runs over mountainous land.
	North, on a random line, bet. secs. 2 and 3. Va. 18° 30′ E.
	Ascend abruptly, through heavy pine timber.
40.00	Set temporary ¼ sec. cor.
75.30	Top of spur, about 850 ft. above last sec. cor. Leave timber and enter open ground.
80.10	Intersect N. boundary of township 50 lks. W. of cor. to secs. 2, 3, 34, and 35, which
	A post, 4 ins. square, marked
	T. 7 N. S. 35 on N. E.,
	R. 34 E. S. 2 on S. E.,
	T. 6 N. S. 3 on S. W., and
	S. 34 on N. W. faces, with 6 notches on E. and 4 notches on W. edges, and mound of stone around post.
	Thence I run
	S. 0° 21′ W., on a true line, bet. secs. 2 and 3, with same va.
40.10	A pine, 16 ins. diam., which I mark ¼ S. on W. face, for ¼ sec. cor., from which
	A pine, 14 ins. diam., bears S. 40° E., 78 lks. dist., marked ¼ S. B. T.
	A pine, 20 ins. diam., bears N. 70° W., 24 lks. dist., marked ¼ S. B. T.
80.10	The cor. to secs. 2, 3, 10, and 11.
	Land, mountainous and broken.
	Soil, rocky—4th rate.
	Timber, pine—75.30 chs.
	Whole line runs over mountainous land.

August 11, 1880.

From the cor. to secs. 3, 4, 33, and 34 on the S. boundary of the township, which is a sandstone, 23 × 4 × 3 ins., with 3 notches on E. and W. edges, and mound of stone alongside,
I run
North, bet. secs. 33 and 34.
Va. 18° 30′ E.
Over bottom land.

Subdivisions, T. 6 N., R. 34 E.—Continued.

Chains.	
40.00	Set a post 3 ft. long, 3 ins. square, with marked stone, 12 ins. in the ground, for ¼ sec. cor., marked ¼ S. on W. face; dug pits 18 × 18 × 12 ins. N. and S. of post, 5½ ft. dist., and raised a mound of earth 1½ ft. high, 3½ ft. base, around post.
45.10	Stream, 8 lks. wide, course E., joins another stream about 20 chs. E. of line.
76.20	Stream, 8 lks. wide, course S. E., joins first stream.
80.00	Set a post 4 ft. long, 4 ins. square, with marked stone, 12 ins. in the ground, for cor. to secs. 27, 28, 33, and 34, marked T. 6 N. S. 27 on N. E., R. 34 E. S. 34 on S. E., S. 33 on S. W., and S. 28 on N. W. faces, with 1 notch on S. and 3 notches on E. edges; dug pits 18 × 18 × 12 ins. in each sec., 5½ ft. dist., and raised a mound of earth 2 ft. high, 4½ ft. base, around post. Land level. Soil, rich black loam—1st rate. No timber.

East, on a random line, bet. secs. 27 and 34.
Va. 18° 30′ E.
Over bottom land.

40.00	Set temporary ¼ sec. cor.
79.87	Intersect N. and S. line, 27 lks. S. of cor. to secs. 26, 27, 34, and 35.
	Thence I run
	S. 89° 48′ W., on a true line, bet. secs. 27 and 34, with same va.
39.94	Deposited a marked stone 12 ins. in the ground for ¼ sec. cor., dug pits 18 × 18 × 12 ins. E. and W. of cor., and raised mound of earth 1½ ft. high, 3½ ft. base, over it. In E. pit drove stake 2 ft. long, 2 ins. square, 12 ins. in the ground, marked ¼ S. on N. face.
79.87	The cor. to secs. 27, 28, 33, and 34.
	Land level.
	Soil, rich black loam—1st rate.
	No timber.

North, bet. secs. 27 and 28.
Va. 18° 30′ E.
Over bottom land.

1.00	Creek, 7 lks. wide, course S. W.
3.80	Same creek, course S. E.
20.00	Telegraph line, course E.
27.10	Road to Miles City, course N. E.
40.00	Set a sandstone 17 × 6 × 3 ins. 11 ins. in the ground, for ¼ sec. cor., marked ¼ on W. side, dug pits 18 × 18 × 12 ins. N. and S. of stone, 5½ ft. dist., and raised a mound of earth 1½ ft. high, 3½ ft. base, alongside.
80.00	Set a sandstone 22 × 6 × 4 ins., 15 ins. in the ground, for cor. to secs. 21, 22, 27 and 28, marked with 2 notches on S. and 3 notches on E. edges; dug pits 18 × 18 × 12 in each sec., 5½ feet dist., and raised a mound of earth 2 ft. high, 4½ ft. base, alongside.
	Land, level.
	Soil, rich black loam—1st rate.
	No timber.

East, on a random line, bet. secs. 22 and 27.
Va. 18° 30′ E.
Over level land.

40.00	Set temporary ¼ sec. cor.
58.00	Small couleé, about 2 ft. deep, course S. E., thence over gently rolling land.
79.80	Intersect N. and S. line, 23 lks. N. of cor. to secs. 22, 23, 26 and 27.
	Thence I run
	N. 89° 50′ W., on a true line, bet. secs. 22 and 27, with same va.

Subdivisions, T. 6 N., R. 34 E.—Continued.

Chains.	
39.90	Set a sandstone 16×5×4 ins., 11 ins. in the ground, for ¼ sec. cor., marked ¼ on N. side, dug pits 18×18×12 ins. E. and W. of stone, 5½ ft. dist., and raised mound of earth 1½ ft. high, 3½ ft. base, alongside.
79.80	The cor. to secs. 21, 22, 27 and 28.
	Land, level and rolling.
	Soil, black loam and sandy, 1st and 2d rate.
	No timber.
	August 9, 1880.

North, bet. secs. 21 and 22.
Va. 18° 30′ E.

	Over gently rolling ground, descending.
15.00	Enter swamp.
40.00	Set a sandstone 20×14×3 ins., 15 ins. in the ground, for ¼ sec. cor., marked ¼ on W. face, dug pits 18×18×12 ins. N. and S. of stone, 5½ ft. dist., and raised a mound of earth 1½ ft. high, 3½ ft. base, alongside.
62.00	Leave swamp, thence over gently rolling ground.
76.20	Old military road, course N. W.
80.00	Deposited a marked stone, 12 ins. in the ground, for cor. to secs. 15, 16, 21, and 22, dug pits 18 × 18 × 12 ins. in each sec., 5½ ft. dist., and raised a mound of earth 2 ft. high, 4½ ft. base, over it. In S. E. pit drove stake 2 ft. long, 2 ins. square, 12 ins. in the ground, marked T. 6 N. S. 15 on N. E., R. 34 E. S. 22 on S. E., S. 21 on S. W., and S. 16 on N. W. faces, with 3 notches on S. and E. edges.
	Land, gently rolling, and swamp.
	Soil, sandy and wet loam—2d rate.
	No timber.
	NOTE.—Swamp can be drained into Yellowstone River.

East, on a random line, bet. secs. 15 and 22.
Va. 18° 30′ E.

	Over gently rolling ground.
40.00	Set temporary ¼ sec. cor.
66.25	Commence ascending to table land.
68.40	Top, about 40 feet high, thence over table land to
79.66	Intersect N. and S. line, 25 lks. N. of cor. to secs. 14, 15, 22, and 23. Thence I run
	N. 89° 49′ W., on a true line, bet. secs. 15 and 22, with same va.
39.83	Set a sandstone 16 × 14 × 5 ins., 11 ins. in the ground, for ¼ sec. cor., marked ¼ on N. face, and raised a mound of stone alongside.
79.66	The cor. to secs. 15, 16, 21, and 22.
	Land, rolling and table.
	Soil, sandy—2d rate.
	No timber.
	August 10, 1880.

North, bet. secs. 15 and 16.
Va. 18° 30′ E.

	Over gently rolling ground.
40.00	Set a sandstone 16 × 12 × 3 ins. 11 ins. in the ground, for ¼ sec. cor., marked ¼ on W. face, dug pits 18 × 18 × 12 ins. N. and S. of stone, 5½ ft. dist., and raised a mound of earth 1½ ft. high, 3½ ft. base, alongside. Wells' house bears N. W. 6.00 chs. dist.
50.00	Easterly end of pond bears W. about 10 chs. dist.
80.00	Set a sandstone 20 × 6 × 4 ins. 15 ins. in the ground, for cor. to secs. 9, 10, 15, and 16, marked with 4 notches on S. and 3 notches on E. edges, dug pits 18 × 18 × 12 ins. in each sec., 5½ ft. dist., and raised a mound of earth 2 ft. high, 4½ ft. base, alongside.
	Land, rolling.
	Soil, sandy—2d rate.
	No timber.

Subdivisions, T. 6 N., R. 34 E.—Continued.

Chains.	
	East, on a random line, bet. secs. 10 and 15. Va. 18° 30′ E.
	Over rolling ground.
40.00	Set temporary ¼ sec. cor.
54.10	Commence ascending to table land.
56.36	Top, about 50 ft. high, thence over nearly table land to
79.70	Intersect N. and S. line at 41 lks. N. of cor. to secs. 10, 11, 14, and 15. Thence I run
	N. 89° 42′ W. on a true line, bet. secs. 10 and 15, with same va.
39.85	Set a sandstone 20 × 10 × 16, 15 ins. in the ground, for ¼ sec. cor. marked ¼ on N. face, dug pits 18 × 18 × 12 ins. E. and W. of stone, 5½ ft. dist., and raised a mound of earth, 1½ ft. high, 3½ ft. base, alongside.
79.70	The cor. to secs. 9, 10, 15, and 16.
	Land, rolling and table.
	Soil, sandy and gravelly—2d and 3d rate.
	No timber.

	North, bet. secs. 9 and 10. Va. 18° 30′ E.
	Over rolling ground, ascending.
5.40	Enter timber, thence over broken ground.
20.90	Ravine, about 20 ft. deep, course S. W.
40.00	Set a sandstone 24 × 15 × 4 ins. 18 ins. in the ground, for ¼ sec. cor. marked ¼ on W. face; from which A pine, 12 ins. diam., bears S. 75° E., 90 lks. dist., marked ¼ S. B. T. A pine, 11 ins. diam., bears N. 55° W., 30 lks. dist., marked ¼ S. B. T.
80.00	A point about 100 ft. above last sec. cor. Set a post 4 ft. long, 4 ins. square, with marked stone, 24 ins. in the ground, for cor. to secs. 3, 4, 9, and 10, marked T. 6 N. S. 3 on N. E., R. 34 E. S. 10 on S. E., S. 9 on S. W., and S. 4 on N. W. faces, with 5 notches on S. and 3 notches on E. edges, from which A pine, 17 ins. diam., bears N. 23° E., 78 lks. dist., marked T. 6 N., R. 34 E., S. 3, B. T.; A pine, 14 ins. diam., bears S. 47° E., 43 lks. dist., marked T. 6 N., R. 34 E., S. 10, B. T.; A pine, 20 ins. diam., bears S. 10° W., 16 lks. dist., marked T. 6 N., R. 34 E., S. 9, B. T.; A pine, 10 ins. diam., bears N. 73° W., 82 lks. dist., marked T. 6 N., R. 34 E., S. 4, B. T.
	Land, rolling and broken.
	Soil, sandy and rocky—3d and 4th rate.
	Timber, pine; 74.60 chs.

	East, on a random line bet. secs. 3 and 10. Va. 18° 30′ E.
	Ascend steep west slope of spur of mountain, over broken ground, and through heavy pine timber.
13.20	Pine, 24 ins. diam.
17.62	Pine, 20 ins. diam.
40.00	Set temporary ¼ sec. cor.
67.03	Pine, 30 ins. diam.
79.80	A point about 700 ft. above last sec. cor. and intersect N. and S. line, 30 lks. N. of cor. to secs. 2, 3, 10, and 11. Thence I run
	N. 89° 47′ W. on a true line, betw. secs. 3 and 10, with same va.
39.90	A pine, 28 ins. diam., which I mark ¼ S. on N. face for ¼ sec. cor.; from which A pine, 16 ins. diam., bears S. 42° E., 30 lks. dist., marked ¼ S. B. T. A pine, 40 ins. diam., bears N. 23° E., 78 lks. dist., marked ¼ S. B. T.
79.80	The cor. to secs. 3, 4, 9, and 10.
	Land, mountainous.
	Soil, rocky—4th rate.

Subdivisions, T. 6 N., R. 34 E.—Continued.

Chains.	
	Timber, pine; 79. 80 chs. Whole line runs over mountainous land.
	North, on a random line, bet. secs. 3 and 4. Va. 18° 30′ E. Alongside of west slope of spur of mountain, over broken ground, and through pine timber.
31. 10	At this point the needle suddenly changed, showing a va. of 27° 45′ E., and upon examination I found croppings of iron ore. In proceeding north on line, the needle gradually changed, until at
39. 80	It marked a va. of 18° 30′ E.
40. 00	Set temporary ¼ sec. cor.
41. 60	Leave timber.
80. 00	Intersect N. boundary of township, 47 lks. W. of cor., to secs. 3, 4, 33, and 34, which is a sandstone 20 × 8 × 6 ins., with mound of stone alongside. Thence I run S. 0° 20′ W. on a true line, bet. secs. 3 and 4, with same va.
40. 00	Set a sandstone 16 × 14 × 5 ins. 11 ins. in the ground, for ¼ sec. cor., marked ¼ on W. face; from which A pine, 12 ins. diam., bears S. 45° E., 65 lks. dist., marked ¼ S. B. T. A pine, 12 ins. diam., bears S. 30° W., 120 lks. dist., marked ¼ S. B. T.
80. 00	The cor. to secs. 3, 4, 9, and 10. Land, broken. Soil, rocky—4th rate. Timber, pine; 41. 60 chs. Whole line runs over mountainous land. *August* 12, 1880.
	From the cor. to secs. 4, 5, 32, and 33, on the south boundary of the township, which is a post, 4 ins. square, marked T. 6 N. S. 33 on N. E., R. 34 E. S. 4 on S. E., T. 5 N. S. 5 on S. W., and S. 32 on N. W. faces, with 4 notches on E. and 2 notches on W. edges, and pits 18 × 18 × 12 ins. in each sec. 5½ ft. dist., and mound of earth, 2 ft. high, 4½ ft. base, around post. I run North, bet. secs. 32 and 33. Va. 18° 30′ E. Over level bottom.
40. 00	Set a sandstone, 18 × 18 × 3 ins., 12 ins. in the ground for ¼ sec. cor. marked ¼ on W. face, dug pits, 18 × 18 × 12 ins., N. and S. of stone, 5½ ft. dist., and raised a mound of earth 1½ ft. high, 3½ ft. base, alongside.
46. 00	Creek, 6 lks. wide, course S. E.
80. 00	Set a post, 4 ft. long, 4 ins. square, with marked stone, 12 ins. in the ground, for cor. to secs. 28, 29, 32, and 33, marked T. 6 N. S. 28 on N. E., R. 34 E. S. 33 on S. E., S. 32 on S. W., and S. 29 on N. W. faces, with 1 notch on S. and 4 notches on E. edges, dug pits, 18 × 18 × 12 ins., in each sec., 5½ ft. dist., and raised a mound of earth, 2 ft. high, 4½ ft. base, around post. Land level. Soil, rich black loam—1st rate. No timber.
	East on a random line bet. secs. 28 and 33. Va. 18° 30′ E. Over level bottom.
38. 00	Creek, 8 lks. wide, course S. E.
40. 00	Set temporary ¼ sec. cor.
77. 80	Creek, 6 lks. wide, course S. W.

Chains.	
79. 50	Intersect N. and S. line, 10 lks. S. of cor. to secs. 27, 28, 33, and 34.
	Thence I run
	S. 89° 56′ W., on a true line, bet. secs 28 and 33, with same va.
39. 75	Set a sandstone, 20 × 8 × 5 ins., 1[illegible] ins. in the ground, for ¼ sec. cor., marked ¼ on N. face, dug pits 18 × 18 × 12 ins. E. and W. of stone, 5½ ft. dist., and raised a mound of earth, 1½ ft. high, 3½ ft. base, alongside.
79. 50	The cor. to secs. 28, 29, 32, and 33.
	Land, level.
	Soil, rich black loam.
	No timber.

	North, bet. Secs. 28 and 29.
	Va. 18° 30′ E.
	Over level bottom.
16. 30	Ascend about 10 ft., and thence over rolling ground.
40. 00	Set a sandstone, 18 × 16 × 3 ins., 12 ins. in the ground, for ¼ sec. cor., marked ¼ on W. face, dug pits 18 × 18 × 12 ins., N. and S. of stone 5½ ft. dist,, and raised a mound of earth, 1½ ft. high, 3½ ft. base, alongside.
44. 00	Telegraph line, course E.
48. 10	Road to Miles City, course E.
53. 50	Creek, 4 lks. wide, course S. E. Its source, a spring of clear water, about 6 ft. diam., bears N. 80° W., 3.25 chs. dist.
80. 00	Set a post, 4 ft. long, 4 ins. square, with marked stone, 12 ins. in the ground, for cor. to secs. 20, 21, 28, and 29, marked T. 6 N., S. 21 on N. E. R. 34 E., S. 28 on S. E. S. 29 on S. W., and S. 20 on N. W. faces, with 2 notches on S. and 4 notches on E. edges, dug pits 18 × 18 × 12 ins., in each sec., 5½ ft. dist., and raised a mound of earth, 2 ft. high, 4½ ft. base, around post.
	Land, level and rolling.
	Soil, black loam and sandy—1st and 2d rate.
	No timber.

	East, on a random line, bet. secs. 21 and 28.
	Va. 18° 30′ E.
	Over rolling ground.
40. 00	Set temporary ¼ sec. cor.
75. 00	Descend about 20 ft. into bottom land.
79. 40	Intersect N. and S. line at cor. to secs. 21, 22, 27 and 28.
	Thence I run
	West on a true line, bet. Secs. 21 and 28, with same va.
39. 70	Set a sandstone, 20 × 20 × 4 ins., 15 ins. in the ground, for ¼ sec. cor., marked ¼ on N. face; dug pits 18 × 18 × 12 ins., E. and W. of stone, 5½ ft. dist., and raised a mound of earth, 1½ ft. high, 3½ ft. base, alongside.
79. 40	The cor. to secs. 20, 21, 28, and 29.
	Land, rolling and level.
	Soil, sandy and black loam—1st and 2d rate.
	No timber.

	North, bet. secs. 20 and 21.
	Va. 18° 30′ E.
	Over rolling ground.
40. 00	Deposited a marked stone, 12 ins. in the ground, for ¼ sec. cor.; dug pits 18 × 18 × 12 ins., N. and S. of cor., 5½ ft. dist., and raised a mound of earth 1½ ft. high, 3½ ft. base, over it. In N. pit, drove stake, 2 ft. long, 2 ins. square, 12 ins. in the ground, marked ¼ S. on W. face.
80. 00	Set a sandstone, 18 × 15 × 3 ins., 12 ins. in the ground, for cor. to secs. 16, 17, 20, and 21, marked with 3 notches on S. and 4 notches on E. edges; dug pits 18 × 18 × 12 ins. in each sec., 5½ ft. dist., and raised a mound of earth, 2 ft. high, 4½ ft. base, alongside.

Chains.	
	Land rolling. Soil sandy—2d rate. No timber.
	East, on a random line bet. secs. 16 and 21. Va. 18° 30′ E.
	Over rolling ground.
40.00	Set temporary ¼ sec. cor.
77.92	Old military road, course N. W.
79.72	Intersected N. and S. line at cor. to secs. 15, 16, 21 and 22.
	Thence I run
	West, on true line, bet. secs. 16 and 21, with same va.
39.86	Set a post, 3 ft. long, 3 ins. sqnare, with marked stone, 12 ins. in the ground, for ¼ sec. cor., marked ¼ S. on N. face; dug pits 18 × 18 × 12 ins., E. and W. of post, 5½ ft. dist., and raised a mound of earth, 1½ ft. high, 3½ ft. base, around post.
79.72	The cor. to secs. 16, 17, 20 and 21.
	Land, rolling. Soil, sandy—2d rate. No timber.
	From the cor. to secs. 16, 17, 20 and 21. I run
	West, on a true line bet. secs. 17 and 20. Va. 18° 30′ E.
	Knowing that it will strike the easterly shore of Lin's Lake in less than 80 chs.
	Over rolling ground, descending.
15.00	Telegraph line, course N., soon bends to N. W.
20.00	Road to Williamsburg, course N.
40.00	Set a sandstone, 19 × 11 × 4 ins., 14 ins. in the ground, for ¼ sec. cor., marked ¼ on N. face; dug pits 18 × 18 × 12 ins., E. and W. of stone, 5½ ft. dist., and raised a mound of earth, 1½ ft. high, 3½ ft. base, alongside.
43.24	East bank of Lin's Lake. Set a sandstone, 30 × 15 × 8 ins., 22 ins. in the ground, for meander cor. to fractional secs. 17 and 20, marked M. C., and raised a mound of stone, 2 ft. high, 4½ ft. base, alongside.
	Land rolling. Soil sandy—2d rate. No timber.
	North, bet. secs. 16 and 17. Va. 18° 30′ E.
	Over rolling ground.
40.00	Set a sandstone, 20 × 12 × 4 ins., 15 ins. in the ground, for ¼ sec. cor., marked ¼ on W. face; dug pits 18 × 18 × 12 ins. N. and S. of stone, 5½ ft. dist., and raised a mound of earth, 1½ ft. high, 3½ ft. base, alongside. From cor. Wilkie's house bears N. 80° W.
44.60	A creek, 4 lks. wide, course S. W. Wilkie's house bears S. 60° W. Westerly end of pond, area about 50 acres, bears N. E. about 15.00 chs. dist.
80.00	Set a post 4 ft. long, 4 ins. square, with marked stone, 12 ins. in the ground, for cor. to secs. 8, 9, 16, and 17, marked— T. 6 N. S. 9 on N. E. R. 34 E. S. 16 on S. E. S. 17 on S. W., and S. 8 on N. W. faces, with 4 notches on S. and E. edges; dug pits 18 × 18 × 12 ins. in each sec., 5½ ft. dist., and raised a mound of earth, 2 ft. high, 4½ ft. base, alongside.
	Land, rolling. Soil, sandy—2d rate. No timber.

Subdivisions, T. 6 N., R. 34 E.—Continued.

Chains.	
	East on a random line, bet. secs. 9 and 16. Va. 18° 30′ E.
	Over rolling ground.
40.00	Set temporary ¼ sec. cor. Northerly side of pond bears S. about 6.00 chs. dist.
79.90	Intersect N. and S. line, 20 lks. N. of cor. to secs. 9, 10, 15, and 16.
	Thence I run
	N. 89° 51′ W. on a true line, bet. secs. 9 and 16, with same va.
39.95	Set a post, 3 ft. long, 3 ins. square, with marked stone, 12 ins. in the ground, for ¼ sec. cor., marked ¼ S. on N. face; dug pits 18 × 18 × 12 ins. E. and W. of post 5½ ft. dist. and raised a mound of earth, 1½ ft. high, 3½ ft. base, around post.
79.90	The cor. to secs. 8, 9, 16, and 17.
	Land, rolling.
	Soil, sandy—2d rate.
	No timber. *August* 13, 1880.

	North, bet. secs. 8 and 9. Va. 18° 30′ E.
	Over rolling ground.
38.10	Edge of limestone quarry, about 30 ft. deep, to avoid which I run west on an offset line 1.00 ch., thence north 2.50 chs., thence east 1.00 ch. to
40.60	On line, on north side of quarry. Set a limestone 30 × 12 × 8 ins. 22 ins. in the ground, for witness cor. to ¼ sec. cor. marked W. C. ¼ on W. side, and raised a mound of stone 1½ ft. high, 3½ ft. base, alongside.
80.00	Set a limestone, 24 × 8 × 4 ins. 18 ins. in the ground, for cor. to secs 4, 5, 8, and 9, marked with 5 notches on S. and 4 notches on E. edges; dug pits 18 × 18 × 12 ins. in each sec. 5½ ft. dist., and raised a mound of earth, 2 ft. high, 4½ ft. base, alongside.
	Land, rolling.
	Soil, sandy and light—2d and 3d rate.
	No timber.

	East on a random line, bet. secs. 4 and 9. Va. 18° 40′ E.
	Over rolling ground.
40.00	Set temporary ¼ sec. cor. Porter's house bears N. 40° E.
48.10	Wood road, course N. 20° E. Porter's house bears N. 10° E.
79.84	Intersect N. and S. line, 25 lks. N. of cor., to secs. 3, 4, 9, and 10.
	Thence I run
	N. 89° 49′ W., on a true line, bet. secs. 4 and 9, with same va.
39.92	Set a limestone, 16 × 12 × 4 ins., 11 ins. in the ground, for ¼ sec. cor., marked ¼ on N. side, dug pits 18 × 18 × 12 ins. E. and W. of stone, 5½ ft. dist., and raised a mound of earth 1½ ft. high, 3½ ft. base, alongside.
79.84	The cor. to secs. 4, 5, 8, and 9.
	Land, rolling.
	Soil, sandy and light—2d and 3d rate.
	No timber.

	North on a random line, bet. secs. 4 and 5. Va. 18° 40′ E.
	Over rolling ground.
40.00	Set temporary ¼ sec. cor.
79.96	Intersect N. boundary of township 44 lks. W. of cor. to secs. 4, 5, 32, and 33, which is a post, 4 ins. square, marked T. 7 N. S. 33 on N. E., R. 34 E. S. 4 on S. E., T. 6 N. S. 5 on S. W., and S. 32 on N. W. faces, with 4 notches on E. and 2 notches on W. edges, and mound of stone, 2 ft. high, 4½ base, around post.
	Thence I run
	S. 0° 19′ W., on a true line, bet. secs. 4 and 5, with same va.

Subdivisions, T. 6 N., R. 34 E.—Continued.

Chains.	
39.96	Set a sandstone, 18 × 10 × 6 ins., 12 ins. in the ground, for ¼ sec. cor., marked ¼ on W. face, and raised a mound of stone, 1½ ft. high, 3½ ft. base, alongside.
79.96	The cor. to secs. 4, 5, 8, and 9. Land, rolling. Soil, sandy and light—2d and 3d rate. No timber. *August* 16, 1880.
	From the cor. to secs. 5, 6, 31, and 32, on the south boundary of the township, which is a sandstone 20 × 8 × 4 ins. with mound of stone, 2 ft. high, 4½ ft. base alongside, I run North, bet. secs. 31 and 32. Va. 18° 45′ E. Over table land.
40.00	Set a sandstone, 16 × 12 × 6 ins. 11 ins. in the ground, for ¼ sec. cor., marked ¼ on W. side, dug pits 18 × 18 × 12 ins. N. and S. of stone, 5½ ft. dist., and raised a mound of earth, 1½ ft. high, 3½ ft. base, alongside. From this cor. a cor. of James Parker's desert land claim, a post, 8 ins. square, with mound of stone around post, marked J. P. D. L. C. 2, bears S. 20° E., 1.45 chs. dist. The land included in this claim was unsurveyed at date of location.
80.00	Set a sandstone 20 × 14 × 6 ins., 15 ins. in the ground, for cor. to secs. 29, 30, 31, and 32, marked with 1 notch on S. and 5 notches on E. edges, dug pits 18 × 18 × 12 ins. in each sec. 5½ ft. dist., and raised a mound of earth, 2 ft. high, 4½ ft. base, alongside. Land, level table. Soil, sandy—2d and 3d rate. No timber.
	East on a random line, bet. secs. 29 and 32. Va. 18° 45′ E. Over table land.
40.00	Set temporary ¼ sec. cor. From this point a post 8 ins. square, with mound of stone around post, marked J. P. D. L. C. 4 for cor. to James Parker's desert land claim, bears S. 17° E. 64 lks. dist.
51.10	From this point a spring about 2 ft. diam. bears S. about 3 chs. dist. From spring a stream flows S. E.
65.40	Edge of table land, and descend about 70 ft. to
79.60	Intersect N. and S. line 19 lks. S. of cor. to secs. 28, 29, 32, and 33. Thence I run S. 89° 52′ W. on a true line, bet. secs. 29 and 32, with same va.
30.80	Set a sandstone, 17 × 8 × 6 ins., 11 ins. in the ground, for ¼ sec. cor., marked ¼ on N. face, dug pits 18 × 18 × 12 ins. E. and W. of cor., 5½ ft. dist., and raised a mound of earth, 1½ ft. high, 4½ ft. base, alongside.
79.60	The cor. to secs. 29, 30, 31, and 32. Land, table and bottom. Soil, sandy and black loam—1st and 2d rate. No timber.
	West on a random line bet. secs. 30 and 31. Va. 18° 45′ E. Over table land.
40.00	Set temporary ¼ sec. cor. From this point a post 8 ins. square, with mound of stone around post, marked J. P. D. L. C. 8, for cor. to James Parker's desert land claim, bears N. 80° E., 92 lks. dist.
79.18	Intersect west boundary of township 10 lks. N. of cor. to secs. 25, 30, 31, and 36, which is a post, 4 ft. long, 4 ins. square, marked T. 6 N. S. 30 on N. E., R. 34 E. S. 31 on S. E., R. 33 E. S. 36 on S.W., and S. 25 on N.W. faces, with mound of stone, 2 ft. high, 4½ ft. base, around post.

Subdivisions, T. 6 N., R. 34 E.—Continued.

Chains.	
	Thence I run
	N. 89° 56′ E. on a true line, bet. secs. 30 and 31, with same va.
39.18	Set a sandstone 20 × 12 × 8 ins., 15 ins. in the ground, for ¼ sec. cor., marked ¼ on N. face, dug pits 18 × 18 × 12 ins., E. and W. of stone, 5½ ft. dist., and raised a mound of earth, 1½ ft. high, 3½ ft. base, alongside.
79.18	The cor. to secs. 29, 30, 31, and 32.
	Land, table.
	Soil, sandy—2d and 3d rate.
	No timber.
	North bet. secs. 29 and 30.
	Va. 18° 45′ E.
	Over table land.
40.00	Set a post 3 ft. long, 3 ins. square, with marked stone, 12 ins. in the ground, for ¼ sec. cor., marked ¼ S. on W. face, dug pits 18 × 18 × 12 ins. N. and S. of post, 5½ ft. dist., and raised a mound of earth, 1½ ft. high, 3½ ft. base, around post.
	From this cor. a post, 8 ins. square, with mound of stone around post, marked J. P. D. L. C. 6, for cor. to James Parker's desert land claim, bears S. 30° W., 1.47 chs. dist.
55.00	Telegraph line, course E. and W.
60.00	Road to Miles City, course E. and W.
76.10	Edge of table land, and descend gradually.
80.00	A point about 30 ft. below table land. Set a sandstone, 30 × 12 × 8 ins., 23 ins. in the ground, for cor. to secs. 19, 20, 29, and 30, marked with 2 notches on S. and 4 notches on E. edges, dug pits 18 × 18 × 12 ins. in each sec. 5½ ft. dist., and raised a mound of earth, 2 ft. high, 4½ ft. base, alongside.
	Land, table.
	Soil, sandy—2d and 3d rate.
	No timber.
	East on random line, bet. secs. 20 and 29.
	Va. 18° 30′ E.
	Over rolling ground.
40.00	Set temporary ¼ sec. cor.
62.00	Road to Williamsburg, course N.
65.50	Telegraph line, course N.
79.77	Intersect N. and S. line 32 lks. S. of cor. to secs. 20, 21, 28, and 29.
	Thence I run
	S. 89° 46′ W. on a true line bet. secs. 20 and 29, with same va.
39.88	Set a sandstone 20 × 12 × 3 ins. 15 ins. in the ground, for ¼ sec. cor. marked ¼ on N. face, dug pits 18 × 18 × 12 ins. E. and W. of stone 5½ ft. dist., and raised a mound of earth, 1½ ft. high, 3½ base, alongside.
79.77	The cor. to secs. 19, 20, 29, and 30.
	Land, rolling.
	Soil, sandy—2d rate.
	No timber.
	West on a random line, bet. secs. 19 and 30.
	Va. 18° 30′ E.
	Over rolling ground.
40.00	Set temporary ¼ sec. cor.
79.10	Intersect west boundary of township 27 lks. N. of cor. to secs. 19, 24, 25, and 30, which is a post 4 ins. square, marked—
	T. 6 N. S. 19 on N. E.
	R. 34 E. S. 30 on S. E.
	R. 33 E. S. 25 on S. W., and
	S. 24 on N. W. faces, with 4 notches on N. and 2 notches on S. edges, and mound of stone covered with earth, 2 ft. high, 4½ ft. base, around post.
	Thence I run
	N. 89° 48′ E. on a true line bet. secs. 19 and 30, with same va.

Chains.

39.10 Set a sandstone 18 × 12 × 8 ins. 12 ins. in the ground for ¼ sec. cor., marked ¼ on N. face, dug pits 18 × 18 × 12 ins. E. and W. of stone, 5½ ft. dist., and raised a mound of earth, 1½ ft. high, 3½ ft. base, alongside.

79.10 The cor. to secs. 19, 20, 29, and 30.
Land, rolling.
Soil, sandy—2d rate.
No timber.

North, bet. secs. 19 and 20.
Va. 18° 30′ E.
Over rolling ground, descending.

40.00 Set a sandstone 20 × 11 × 6 ins. 15 ins. in the ground, for ¼ sec., cor., marked ¼ on W. face, dug pits 18 × 18 × 12 ins. N. and S. of stone, 5½ ft. dist., and raised a mound of earth, 1½ ft. high, 3½ ft. base, alongside.

44.18 South bank of Lin's Lake. Set a post, 4 ft. long, 4 ins. square, with marked stone, 12 ins. in the ground, for meander cor. to fractional secs. 19 and 20, marked M. C., and
T. 6 N. on S.
R. 34 E. S. 20 on E., and
S. 19 on W. faces, dug pit 3 ft. sq., 12 ins. deep, 8 lks. S. of post, and raised mound of earth, 2 ft. high, 4½ ft. base, around post.
Land, rolling.
Soil, sandy—2d rate.
No timber.

August 14, 1880.

From the cor. to secs. 8, 9, 16, and 17, I run
West on a true line bet. secs. 8 and 17.
Va. 18° 30′ E.
Over rolling ground.

35.00 Road to Williamsburg, course N. W.

40.00 Set a sandstone 16 × 11 × 8 ins. 11 ins. in the ground, for ¼ sec. cor., marked ¼ on N. face, dug pits 18 × 18 × 12 ins. E. and W. of stone, 5½ ft. dist., and raised a mound of earth, 1½ ft. high, 3½ ft. base, alongside.

45.00 Telegraph line, course N. 60° W.

80.00 Set a sandstone 24 × 11 × 6 ins. 18 ins. in the ground for cor. to secs. 7, 8, 17, and 18, marked with 4 notches on S. and 5 notches on E. edges, dug pits 18 × 18 × 12 ins. in each sec. 5½ ft. dist. and raised a mound of earth, 2 ft. high, 4½ ft. base, alongside.
Land, rolling.
Soil, sandy—2d rate.
No timber.

South, bet. secs. 17 and 18.
Va. 18° 45′ E.
Over even ground, descending.

20.19 North bank of Lin's Lake. Set a sandstone 24 × 10 × 8 ins., 18 ins. in the ground, for meander cor. to fractional secs. 17 and 18, marked M. C., and raised a mound of stone, 2 ft. high, 4½ ft. base, alongside.
Land, nearly level.
Soil, sandy and black loam—1st and 2d rate.
No timber.

August 13, 1880.

West, on a random line, bet. secs. 7 and 18.
Va. 18° 45′ E.
Over gently rolling ground.

24.10 Intersect E. boundary line of town of Williamsburg. N. E. cor., which is a post, 12 ins. square, marked "T. S. 2," with mound of stone around post, bears N. 40 chs. S. E. cor., which is a post, 12 ins. square, marked "T. S. 1," with mound of stone around post, bears S. 7.35 chs.

Subdivisions, T. 6 N., R. 34 E.—Continued.

Chains.	
29.10	Center of street, course N. and S.
34.10	Center of street, course N. and S.
39.10	Center of street, course N. and S.
40.00	Set temporary ¼ sec. cor. From this point, the court-house in the town of Williamsburg bears N. 10° W.
44.10	Center of Main street of Williamsburg, course N. and S. Court-house bears N.
48.35	Episcopal church bears N. 10° W. 4.50 chs. dist.
49.10	Center of street, course N. and S.
54.10	Center of street, course N. and S.
56.75	Methodist church bears S. 13½° W.
59.10	Center of street, course N. and S.
60.00	Intersect W. boundary line of town of Williamsburg. N. W. cor. which is a post, 12 ins. square, marked "T. S. 3," with mound of stone around post, bears N. 40 chs. S. W. cor., which is a post, 12 ins. square, marked "T. S. 4," with mound of stone around post, bears S. 29.75 chs.
62.10	Methodist church bears S. 45° E.
78.20	Intersect W. boundary of township, 14 lks. S. of cor. to secs. 7, 12, 13, and 18, which is a post, 4 ins. square, marked T. 6 N. S. 7 on N. E., R. 34 E. S. 18 on S. E., R. 33 E. S. 13 on S. W., and S. 12 on N. W. faces, with 2 notches on N. and 4 notches on S. edges, and mound of stone, 2 ft. high, 4½ ft. base, around post.
	Thence I run
	S. 89° 54′ E., on a true line, bet. secs. 7 and 18, with same va.
38.20	Set a sandstone, 18 × 15 × 5 ins., 12 ins. in the ground, for ¼ sec. cor., marked ¼ on N. face; dug pits 18 × 18 × 12 ins., E. and W. of stone, 5½ ft. dist., and raised a mound of earth, 1½ ft. high, 4½ ft. base, alongside.
78.20	The cor. to secs. 7, 8, 17, and 18.
	Land, rolling.
	Soil, sandy—2d rate.
	No timber.

	North, bet. secs. 7 and 8.
	Va. 18° 45′ E.
	Over rolling ground.
29.00	Telegraph line, course W.
30.10	Road to Williamsburg, course E. and W. changes to S. E. about 10 chs. E. of line.
40.00	Set a limestone, 20 × 15 × 8 ins., 15 ins. in the ground, for ¼ sec. cor., marked ¼ on W. face, and raised a mound of stone, 1½ ft. high, 3½ ft. base, alongside.
80.00	Set a sandstone, 15 × 15 × 6 ins., 10 ins. in the ground, for cor. to secs. 5, 6, 7, and 8, marked with 5 notches on S. and E. edges, and raised a mound of stone, 2 ft. high, 4½ ft. base, alongside.
	Land, rolling.
	Soil, sandy—2d rate.
	No timber.

	East, on a random line, bet. secs. 5 and 8.
	Va. 18° 45′ E.
	Over rolling ground.
16.40	Road to Williamsburg, course S.
40.00	Set temporary ¼ sec. cor.
79.96	Intersected N. and S. line, 6 lks. N. of cor. to secs. 4, 5, 8, and 9.
	Thence I run
	N. 89° 56′ W. on a true line, bet. secs. 5 and 8, with same va.
39.98	Set a post, 3 ft. long, 3 ins. square, with marked stone, 12 ins. in the ground, for ¼ sec. cor., marked ¼ S. on N. face; dug pits, 18 × 18 × 12 ins. E. and W. of post, 5½ ft. dist., and raised a mound of earth, 1½ ft. high, 3½ ft. base, around post.
79.96	The cor. to secs. 5, 6, 7, and 8.
	Land, rolling.
	Soil, sandy—2d rate.
	No timber.

Chains.	
	West, on a random line, between secs. 6 and 7. Va. 18° 45′ E.
	Over rolling ground.
27.15	Road to Williamsburg, course S.
40.00	Set temporary ¼ sec. cor.
78.40	Intersect west boundary of township 15 lks. S. of cor. to secs. 1, 6, 7, and 12, which is a post, 4 ft. long, 4 ins. square, marked T. 6 N. S. 6 on N. E., R. 34 E. S. 7 on S. E., R. 33 E. S. 12 on S. W., and S. 1 on N. W. faces, with pits, 18 × 18 × 12 ins., in each sec., 5½ ft. dist., and mound of earth, 2 ft. high, 4½ ft. base, around post.
	Thence I run
	S. 89° 54′ E. on a true line, bet. secs. 6 and 7, with same va.
38.40	Set a sandstone, 18 × 14 × 3 ins. 12 ins. in the ground, for ¼ sec. cor., marked ¼ on N. side, dug pits 18 × 18 × 12 ins. E. and W. of stone, 5½ ft. dist., and raised a mound of earth, 1½ ft. high, 3½ base, alongside.
78.40	The cor. to secs. 5, 6, 7, and 8.
	Land, rolling.
	Soil, sandy—2d rate.
	No timber.

	North, on a random line, bet. secs. 5 and 6. Va. 18° 45′ E.
	Over rolling ground.
40.00	Set temporary ¼ sec. cor.
80.05	Intersect N. boundary of township 20 lks. E. of cor. to secs. 5, 6, 31, and 32, which is a sandstone, 30 × 12 × 6 ins., marked with 5 notches on E. and one notch on W. edges, and mound of stone, 2 ft. high, 4½ ft. base, alongside.
	Thence I run
	S. 0° 09′ E. on a true line, bet. secs. 5 and 6, with same va.
40.05	Set a sandstone, 16 × 12 × 3 ins., 11 ins. in the ground, for ¼ sec. cor., marked ¼ on W. face, dug pits 18 × 18 × 12 ins. N. and S. of stone, 5½ ft. dist., and raised a mound of earth, 1½ ft. high, 3½ ft. base, alongside.
80.05	The cor. to secs. 5, 6, 7, and 8.
	Land, rolling.
	Soil, sandy—2d rate.
	No timber.

August 16, 1880.

MEANDERS OF THE RIGHT BANK OF THE YELLOWSTONE RIVER, UP STREAM.

I commence at the meander cor. to fractional secs. 31 and 36, on the east boundary of the township, which is a sandstone, 24 × 10 × 5 in., marked M. C., with pit 3 ft. sq., 1 ft. deep, 8 lks. S. of stone, with mound of earth, 2 ft. high, 4½ ft. base, alongside.

Thence I run with meanders in sec. 36.
Va. 18° 45′ E.

Bank, 20 ft. high.

S. 65¾° W.	4.00 chs.		
S. 78½° W.	7.40	"	Lower end of bar bears N. 15° W. about 5.00 chs. dist.
S. 63¾° W.	7.60	"	At 6.60 chs. leave bluff bank, bank 15 ft. high.
S. 89¾° W.	8.40	"	
N. 72¼° W.	10.00	"	
N. 60° W.	7.60	"	Bank 10 ft. high.
N. 33½° W.	4.70	"	
N. 50½° W.	7.80	"	At 1.90 chs. mouth of creek.
N. 60° W.	4.80	"	
N. 72½° W.	3.80	"	At 2.80 chs. enter Curran's field, fence course S.
N. 78½° W.	4.80	"	
S. 77½° W.	3.50	"	Bank 6 ft. high.
N. 80½° W.	5.00	"	Leave Curran's field, fence course S.
N. 71° W.	2.40	"	

N. 25½° W. 2.40 chs.
N. 71½° W. 3.50 " Low bank, 3 ft. high.
N. 76½° W. 1.40 " To meander cor. to fractional secs. 35 and 36.
Land, 18 chs. W. part bluff, remainder level bottom.
Soil, black loam and sandy—1st and 2d rate.
No timber.

Thence in sec. 35.
Va. 18° 30′ E.
In dense brush and scattering timber,
S. 86½° W. 2.30 chs.
S. 75½° W. 3.30 "
S. 65° W. 2.30 " Upper end of bar.
S. 35½° W .11.00 " At 6.00 chs. leave brush. At 7.50 chs. Curran's house bears S. 1.50 chs. At end of course, enter Alexander's field, fence course S.
S. 38¼° W. 5.60 chs.
S. 46½° W. 9.00 "
S. 54½° W. 5.00 " At 3.00 chs. enter brush. At 4.00 chs. leave field.
S. 44½° W. 2.00 "
S. 65° W. 2.60 " At 50 lks. mouth of slough, 2.00 chs. wide.
S. 55½° W. 8.70 "
S. 55½° W. 2.80 "
S. 48½° W. 5.80 " Leave scattering timber.
S. 56½° W. 8.70 " Banks, 4 ft. high.
S. 40¼° W. 16.12 " (At 12.00 chs. leave brush. Head of slough 1.00 ch. wide) to meander cor. to fractional secs. 2 and 35 on S. boundary of township, which is a sandstone 20 × 10 × 8 ins. marked M. C. with mound of stone 2 ft. high, 4½ ft. base, alongside.
Land, level bottom.
Soil, black loam—1st rate.
Timber and dense brush, cottonwood and willow, together 56.50 chs.

August 6, 1880.

MEANDERS OF ISLAND CONTAINED IN SECS. 25, 26, 35, AND 36.

This island is partly in this township and partly in T. 6, N., R. 35 E.
I go to the point for meander cor. to fractional secs. 21 and 36 on the south side of island, and finding cor. has been washed away, I re-establish it as follows: I go to a cottonwood tree on line, which is described in field notes of the survey of the east boundary of this township as being 26.23 chs. S. of cor. to secs. 30, 31, 35 and 36, and run S. 3.02 chs. to south bank of island, making altogether 29.25 chs. instead of 29.70 chs. as stated in said notes. At this point
Set a post, 4 ft. long, 4 ins. square, 12 ins. in the ground, for meander cor. to fractional secs. 31 and 36, marked—
T. 6 N. on N.
R. 35 E. S. 31 on E.
M. C. on S., and
R. 34 E. S. 36 on W. faces, dug pit 3 ft. sq., 1 ft. deep, 8 lks. N. of post, and raised mound of earth, 2 ft. high, 4½ ft. base, around post.
Thence I run with meanders in sec. 36,
Va. 18° 45′ E.
Through dense brush, up stream, banks 10 ft. high.
S. 70½° W. 2.40 chs. Lower end of bar bears S.
S. 86° W. 3.00 " Leave brush.
N. 81° W. 8.50 "
N. 68½° W. 7.00 " At 1.00 ch. enter timber and brush.
N. 73½° W. 7.30 " At 7.00 chs. leave timber and brush.
N. 84° W. 3.40 " At 1.50 chs. center of head of slough, 3.00 chs. wide. At end of course, head of bar bears S. Enter brush.
N. 61½° W. 1.50 chs.
N. 60½° W. 3.50 "
N. 53¼° W. 2.50 "

Meanders, T. 6 N., R. 34 E.—Continued.

N. 61¼° W. 2.60 "
N. 57¼° W. 4.90 chs. Enter timber, leave brush.
N. 62½° W. 8.20 "
N. 71¼° W. 4.80 "
N. 77½° W. 5.80 "
N. 88½° W. 5.40 " Leave timber.
S. 80° W. 9.60 " At 1.25 chs., mouth of slough, 2 chs. wide. At 2.50 chs. enter dense brush, and leave brush at end of course.
N. 88¾° W. 3.75 chs. (At 2.00 chs., center of head of slough, 2.50 chs. wide) to meander cor. to fractional secs. 35 and 36 on S. W. end of island.
Land, level.
Soil, alluvial—1st rate.
Timber and brush, cottonwood and willow, 71.70 chs.

Thence in sec. 35.
Va. 18° 20′ E.
Along low bank.
S. 79° W. 6.70 chs.
N. 15½° W. 3.90 "
N. 7½° W. 3.40 "
N. 17½° E. 3.80 "
N. 50° E. 2.59 " To meander cor. to fractional secs. 26 and 35.
Land, level.
Soil, alluvial—1st rate.
No timber.

Thence in sec. 26.
Va. 18° 20′ E.
N. 52¾° E. 6.05 chs. To meander cor. to fractional secs. 25 and 26.
Land, level.
Soil, alluvial—1st rate.
No timber.

Thence in sec. 25.
Va. 18° 20′ E.
Enter brush, bank 5 ft high.
N. 64° E. 2.50 chs.
N. 69¾° E. 8.80 " At 5.00 chs. leave brush, enter heavy timber.
N. 63½° E. 9.40 " Bank, 8 ft. high.
N. 63¾° E. 9.10 "
N. 49° E. 4.30 "
N. 33° E. 2.30 "
N. 13¾° E. 9.00 " Enter brush.
N. 46½° E. 4.80 " Bank, 6 ft. high.
N. 27½° E. 7.30 "
N. 34½° E. 4.70 " Bank, 8 ft. high.
N. 45½° E. 4.60 "
N. 61½° E. 17.00 "
N. 74½° E. 11.00 "
N. 89¼° E. 6.50 "
N. 54¾° E. .69 " To meander cor. to fractional secs. 25 and 30 on E. boundary of township, which is a sandstone 30 × 12 × 8 ins., marked M. C. on N. face, from which
A cottonwood, 10 ins. diam., bears S. 28° W. 20 lks. dist., marked T. 6. N., R. 34. E., S. 25. M. C. B. T.
A cottonwood, 8 ins. diam., bears S. 45° E., 30 lks. dist., marked T. 6. N., R. 35 E., S. 30 M. C. B. T.
Land, level.
Soil, alluvial—1st rate.

Timber and brush, cottonwood and willow, 102.49 chs.
This island has a rich alluvial soil, and is generally covered with fine cottonwood timber.

August 7, 1880.

MEANDERS OF THE LEFT BANK OF THE YELLOWSTONE RIVER, DOWN STREAM.

I commence at the meander cor. to fractional secs. 2 and 35, which is a sandstone, 20 × 15 × 2 ins., marked M. C., with mound of stone, 2 ft. high, 4½ ft. base, alongside.
Thence I run with meanders in Sec. 35.
Va. 18° 30′ E.
Bank 6 ft. high.
N. 47° E. 2.80 chs.
N. 37¼° E. 6.30 "
N. 31° E. 5.50 "
N. 31⅓° E. 6.40 "
N. 38¾° E. 7.10 " Bar in river bears S. 20° E. 1 ch. dist.
N. 27° E. 2.70 "
N. 53⅓° E. 4.00 "
N. 47½° E. 4.90 "
N. 51¼° E. 6.00 "
N. 54½° E. 12.00 "
N. 52¾° E. 6.00 "
N. 47⅜° E. 3.90 "
N. 40½° E. 8.50 " At 7.00 chs. enter dense willow brush.
N. 28¼° E. 7.60 "
N. 31° E. 3.70 " Leave brush.
N. 15½° E. 9.20 "
N. 33⅓° E. 3.80 "
N. 50¼° E. 6.42 " To meander cor. to fractional secs. 26 and 35.
Land, level.
Soil, alluvial—1st rate.
No timber. 12.80 chs. of dense willow brush.

Thence in Sec. 26.
Va. 18° 20′ E.
N. 59° E. 4.80 chs.
N. 45½° E. 7.80 "
N. 49° E. 2.05 " To meander cor. to fractional secs. 25 and 26.
Land, level.
Soil, alluvial—1st rate.
No timber or brush.

August 9, 1880.

Thence in sec. 25.
Va. 18° 20′ E.
N. 65¾° E. 7.40 chs.
N. 63½° E. 5.30 "
N. 61¼° E. 12.00 " At 7.00 chs. head of slough, 2.00 chs. wide.
N. 40⅓° E. 5.60 "
N. 35° E. 7.70 "
N. 7¾° E. 2.50 "
N. 1⅓° W. 2.70 " At 1.90 chs. mouth of slough, 1.50 chs. wide.
N. 41½° E. 9.00 "
N. 35° E. 1.70 "
N. 41° E. 4.60 "
N. 40½° E. 5.60 " At 1.00 ch. enter cottonwood timber.
N. 54¾° E. 3.00 "
N. 54° E. 3.00 " At 2.00 chs. mouth of Short Ck., 10 lks. wide.
N. 49½° E. 2.60 " Fletcher's Stage Station bears N. 6.50 chs. dist.
N. 62½° E. 11.30 "

N. 72° E. 5.70 chs.
S. 87¼ E. 13.00 "
N. 67¼ E. 0.80 chs., to meander cor. to fractional secs. 25 and 30 on E. boundary of township, which is a sandstone 18 × 12 × 6 ins., marked M. C., from which
A cottonwood 4 ins. diam. bears N. 73° E., 48 lks. dist., marked T. 6 N., R. 35 E., S. 30 M. C. B. T.
A cottonwood 24 ins. diam. bears N. 27° W. 185 lks. dist., marked T. 6 N., R. 34 E., S. 25 M. C. B. T.
Land, level.
Soil, alluvial—1st rate.
44.00 chs. of fine cottonwood timber.

August 7, 1880.

MEANDERS OF EASTERLY END OF LIN'S LAKE IN SECS. 17, 18, 19, AND 20.

I commence at the meander cor. to fractional secs. 19 and 24 on west boundary of township, which is a post, 4 ft. long, 4 ins. sq., marked M. C., with
T. 6. N. on N.,
R. 34 E. S. 19 on E., and
R. 33 E. S. 24 on W. faces; from which
A cottonwood 24 ins. diam. bears S. 45° W., 11 lks. dist., marked T. 6 N., R. 33 E., S. 24 M. C. B. T.
A cottonwood 20 ins. diam. bears S. 57° E., 14 lks. dist., marked T. 6 N., R. 34 E., S. 19 M. C. B. T.
Thence I run with meanders in sec. 19.
Var. 18° 20′ E.
Through cottonwood timber. Bank 3 ft. high.
S. 59° E. 8.80 chs.
S. 46½° E. 3.40 " Leave timber.
S. 44½° E. 2.40 "
S. 43¾° E. 5.70 "
S. 43° E. 4.40 "
S. 46¼° E. 5.80 "
S. 52¾° E. 5.80 "
S. 53¾° E. 4.50 "
S. 70¼° E. 5.50 "
S. 75½° E. 3.00 "
S. 88½° E. 4.00 "
N. 78° E. 9.60 " At 6.00 chs. Smith's house bears S., 50 lks. dist.
S. 88½° E. 6.50 "
S. 72¼° E. 6.70 "
S. 71¼° E. 14.00 " To meander cor. to fractional secs 19 and 20.
Land, level.
Soil, sandy loam—2d rate.
Timber, cottonwood, 12.20 chs.

Thence in sec. 20.
Va. 18° 30′ E.
N. 89° E. 6.20 chs.
N. 55½° E. 11.50 "
N. 32½° E. 9.90 "
N. 48¾° E. 6.40 "
N. 31½° E. 5.00 "
N. 24¾° E. 3.90 "
N. 22½° E. 2.10 "
N. 33° E. 2.40 "
N. 32¼ E. 3.40 "
N. 51¾° E. 3.30 chs. to meander cor. to fractional secs. 17 and 20.
Land, level
Soil, sandy loam—2d rate.
No timber.

Meanders, T. 6 N., R. 34 E.—Continued.

Thence in sec. 17.
Va. 18° 30′ E.

N. 20° E.	11.00 chs.		
N. 8½° W.	10.10	"	At 6.00 chs. mouth of ck. 5 lks. wide.
N. 83½° W.	2.00	"	
N. 76° W.	2.30	"	
N. 69¾° W.	7.00	"	
N. 83¾° W.	6.10	"	
N. 53¼° W.	8.00	"	
N. 20¼° W.	14.00	"	
N. 13½° W.	6.80	"	
N. 39° W.	2.30	"	
N. 47½° W.	6.00	"	
N. 49¾° W.	5.00	"	
N. 55½° W.	3.50	"	
N. 49¼° W.	0.20 chs., to meander cor. to fractional secs. 17 and 18.		

Land, level.
Soil, sandy loam—2d rate.
No timber.

August 14, 1880.

Thence in sec. 18.
Va. 18° 30′ E.

N. 38¾° W.	15.00 chs.		
N. 63¾° W.	5.00	"	
S. 84° W.	13.00	"	At 10.28 chs. S. E. cor., town of Williamsburg.
S. 61¼° W.	19.00	"	At 3.08 chs. center of street, course N.
			At 8.79 chs. center of street, course N.
			At 14.49 chs. center of street, course N.
S. 43° W.	13.00	"	At 0.94 ch. center of main street, course N.
			At 8.27 chs. center of street, course N.
S. 55½° W.	4.00	"	At 2.15 chs. center of street, course N.
S. 74¾° W.	4.70	"	At 4.53 chs. S. W. cor. town of Williamsburg.
S. 85½° W.	5.60	"	
N. 88¼° W.	12.47	"	to meander cor. to fractional secs. 13 and 18 on W. boundary of township, which is a sandstone, 30 × 12 × 8 ins., marked M. C., with mound of stone 2 ft. high, 4½ ft. base, alongside.

Land, level.
Soil, sandy loam—2d rate.
No timber.

August 16, 1880.

7 miles 36 chs. and 82 lks. of the subdivision lines run over mountainous land, or through timber; and 3 miles 59 chs. and 69 lks. of the meander lines run through timber or dense brush.

GENERAL DESCRIPTION.

This township contains nearly every variety of land from plains to mountains, and the soil ranges from alkali to rich loam. The soil of the bottom land along the Yellowstone River and on the island is generally rich, black loam, capable of producing abundant crops without irrigation. The soil of the remaining portion of the township, except the alkali flat in secs. 23 and 24, and the mountainous land, can nearly all be classed as second rate, is covered with an abundant growth of rich and nutritious grasses, and will produce crops without irrigation. In the southwestern portion of the township only the grass is more scanty, and irrigation may be necessary.

Cottonwood timber is found along the Yellowstone River, on the island, and some scattering along the creeks. The mountain is covered with a dense growth of pine and fir timber, many of the trees being very large.

There is one limestone quarry in secs. 8 and 9 which affords excellent building stones, and, from surface indications, it is probable that large bodies of limestone and sandstone underlie other portions of the township. Iron ore was found in sec. 3.

The township is well watered by the Yellowstone River, which runs through the southeastern portion, and many small springs and brooks. The eastern end, comprising only a small portion of Lin's Lake, is included in this township. This lake is about 10 miles long, and its greatest width about 4 miles. The water is clear and pure, and varies in depth from 10 to 200 feet.

The town of Williamsburg is the county seat of Custer County, contains a court house, two churches, two hotels, several stores, and about 50 dwelling houses. Its estimated population is 300.

There are two settlers in sec. 35, and one each in secs. 16, 17, 19, and 25.

James Parker has fenced a portion of his desert land claim, in sec. 36, and is boring an artesian well to bring water upon it.

WALTER W. DE LACY,
U. S. Deputy Surveyor.

FINAL OATHS FOR SURVEYS.

LIST OF NAMES.

A list of the names of the individuals employed by Walter W. de Lacy, U. S. deputy surveyor, to assist in running, measuring, and marking the lines and corners described in the foregoing field notes of the survey of the subdivision and meander lines of township No. 6 north, of range No. 34 east of the principal base and meridian, in the Territory of Montana, showing the respective capacities in which they acted :

——— ——— ..... Compassman.
WILLIAM MORAN ..... Chainman.
PETER COOPER ..... Chainman.
——— ——— ..... Chainman.
——— ——— ..... Chainman.
ARTHUR F. FOWLER ..... Axeman.
FRANKLIN J. SAGE ..... Axeman.
JOHN PARKER ..... Flagman.

FINAL OATHS OF ASSISTANTS.

We hereby certify that we assisted Walter W. de Lacy, U. S. deputy surveyor, in surveying all those parts or portions of the subdivision and meander lines of township No. 6 north, of range 34 east of the principal base and meridian, Territory of Montana, as are represented in the foregoing field notes as having been surveyed by him and under his direction; and that said survey has been in all respects, to the best of our knowledge and belief, well and faithfully surveyed, and the corner monuments established, according to the instructions furnished by the U. S. surveyor general for Montana.

——— ———, *Compassman.*
WILLIAM MORAN, *Chainman.*
PETER COOPER, *Chainman.*
——— ———, *Chainman.*
——— ———, *Chainman.*
ARTHUR F. FOWLER, *Axeman.*
FRANKLIN J. SAGE, *Axeman.*
JOHN PARKER, *Flagman.*

Subscribed and sworn to before me this twenty-third day of August, 1880.
[SEAL.]
JOHN JENKINS,
Notary Public.

FINAL OATH OF U. S. DEPUTY SURVEYOR.

I, Walter W. de Lacy, U. S. deputy surveyor, do solemnly swear that in pursuance of instructions received from Roswell H. Mason, U. S. surveyor-general for Montana, bearing date of the third day of July, 1880, I have well, faithfully, and truly, in my own proper person, and in strict conformity with the instructions furnished by the U. S. surveyor general for Montana, the surveying manual, and the laws of the United States, surveyed all those parts or portions of the subdivision and meander lines of township No. 6 north, of range No. 34 east of the principal base and meridian, in the Territory of Montana, as are represented in the foregoing field notes as having been surveyed by me and under my directions; and I do further solemnly swear that all the corners of said survey have been established and perpetuated in strict accordance with the surveying manual, printed instructions, the special written instructions of the U. S. surveyor general for Montana, and in the specific manner described in the field notes,

and that the foregoing are the *true* field notes of such survey, and should any fraud be detected I will suffer the penalty of perjury under the provisions of an act of Congress approved August 8, 1846.

WALTER W. DE LACY,
U. S. Deputy Surveyor.

Subscribed and sworn to before me this thirty-first day of August, 1880.
[SEAL.]

JOHN JENKINS,
Notary Public.

PRIVATE LAND CLAIM SURVEYS.

1. The instruments used in the survey of private land claims must be the same as those required for the survey of public lands, and must be registered and tested in like manner at the surveyor-general's office previous to the deputy's commencing work; and the instructions for the survey of public lands must, as far as applicable, be strictly observed in the survey of private land claims.

2. The surveyor-general will furnish to the deputy surveyor a full description of the boundary calls of each grant and special instructions for its survey, which description and instructions must be entered *in extenso* at the commencement of the field notes of such survey.

3. The true magnetic variation must be noted at the beginning point of each survey and at each angle thereof, and wherever the variation of the needle is observed to change along the line the same must be noted and the reasons therefor stated, if known.

4. At the end of each mile along a boundary the character of the soil and amount of timber, grass, &c., will be stated; and the date of each day's work in the field must be noted at the end of the record thereof.

5. The requirements in the "Summary of objects and data required to be noted," as set forth in the instructions for the survey of public lands, must be observed by the deputy in the survey of private land claims. Where practicable, bearings must be taken from at least two points on the line to all prominent or otherwise notable objects in the vicinity, and where only one bearing can be taken the estimated distance must be noted.

6. Where the natural objects constituting a boundary call of a grant have become obliterated, or are difficult to recognize and identify, or where there may be a doubt as to the identity of the same, the deputy will request the parties interested, or others having knowledge thereof, to furnish disinterested and credible witnesses, whom he shall cause to be examined under oath, and whose testimony shall be written out in full in his presence and that of the officer administering the oath, and subscribed and sworn to before such officer duly authorized to administer oaths. The wording of the testimony so taken must be clear, precise, and definite, in order that the location of the natural objects constituting the boundary calls may be as clearly understood both in the General Land Office and the surveyor general's office as by the deputy in the field.

7. The testimony of interested parties relative to the location of boundary calls or objects may be taken, but should not be relied on as conclusive. The evidence as to such locations should be obtained, when practicable, from parties having no interest in the grant to be surveyed, and the deputy should thoroughly satisfy himself in every case as to the correct identification and location of the natural objects constituting boundary calls.

8. Where a grant call is a point or object still notorious under the name used in the original muniments of title, the additional testimony

above provided for will not be required, but in such cases the deputy must state in his notes the fact of its being well known by such name, and that he is satisfied that it is the one described in the grant.

9. At the beginning point upon the out boundaries of each grant survey a corner must be established of the same character, size, and materials as prescribed for township corners upon the lines of the survey of public lands, except that only two pits will be dug, one on each side of the corner, on the line. Upon the side of such corner facing the claim the initial letters of the name of the grant, and immediately under the same the letters "Beg. Cor., I" (for beginning corner one), must be neatly cut, chiseled, or affixed.

10. Each of the mile corners or stations of survey must be established in the manner prescribed for the establishment of section corners upon the lines of public surveys, except that they will be marked on the side facing the grant with the initials of the grant and the number of the station or mile, as the case may be; and only two pits will be dug, one on each side of the corner, on the line.

11. Where mile corners are established, except upon meandered portions of the line, half-mile corners will also be established in the manner prescribed for the establishment of quarter-section corners upon the lines of public surveys, except that they will be marked upon the side facing the grant with the initials of the grant.

12. Such other marks, in addition to those above described, will be placed upon the corners as may be required by the surveyor general in his special written instructions.

13. As far as practicable bearings and distances must be taken from each of the corners or stations to two or more trees, or prominent natural objects, if any, within a convenient distance, in the same manner as required in the instructions for the survey of public lands, and such trees or objects must be marked with the initials of the grant, and underneath same the letters "B. T.," or "B. O.," as the case may be.

14. Witness corners will be established, where necessary, in the same manner as required in the instructions for the survey of public lands.

15. In all cases where the lines of the grant boundary surveys intersect the established lines of survey of public lands or private land claims the course and distance from such point of intersection to the nearest corner on the line of the prior survey must be carefully run, measured, and noted, and wherever necessary such corner must be re-established.

16. The survey of a private land claim must always be connected by a line actually run and measured in the field with some corner of the public surveys, if any such have been established within a distance not exceeding two miles from any point on the boundary lines of the private land claim.

17. Boundaries or portions of boundaries of previously established grant surveys, which also form a portion of the boundaries of the claim to be surveyed, will be adopted so far as common to both grants, but no payment will be made for such common boundaries unless it is necessary to re-establish same.

18. Before commencing the survey of any private land claim the deputy surveyor will be furnished from the records of the surveyor general's office with descriptive diagrams of such lines and corners as it is supposed his survey will intersect, or with which it may be necessary to connect same.

19. In the case of confirmed grants the boundary lines must be surveyed and established in strict accordance with the confirmatory decree; and in the case of unconfirmed grants, with the grant calls and the

terms of concession. The field notes must embrace a full, clear, and concise statement of the reasons why each boundary is so established, in order that the theory of the deputy may appear plain to any one reading the same.

20. The deputy surveyor must return with the field notes a topographical map or plat of the survey. As far as practicable all objects described in field notes, and the main features of the tract surveyed, including towns, streams, mountains, roads, &c., must be protracted on such plat as accurately as possible.

21. A general description of each tract must be given at the end of the field notes of the survey of same, which description must embrace a brief statement of the main features of the tract surveyed, character of the land, timber and other natural growth, kinds of mineral, if any, population of towns and settlements, characteristics of mountains, streams, springs, &c., and such other data as may be of importance.

22. The field note books must embrace a list of assistants, and preliminary and final oaths, as required in the instructions for the survey of public lands.

23. Official plats of the survey of private land claims will not be furnished to any person until the cost of surveying and platting same shall have been paid to the United States.

24. All protests against the manner of survey of any particular grant must be made in writing, setting forth fully the grounds of objections, and addressed to the surveyor general of the district within which such survey was made, who will take testimony thereon, if necessary, in accordance with the "Rules of Practice" adopted by the Department of the Interior, and forward same, together with his recommendation in the premises, to the Commissioner of the General Land Office.

25. The survey of each private land claim must be made by the deputy surveyor in strict accordance with the instructions herein contained, and such special instructions as may be given him in each particular case.

8 INS

O

DIAGRAM A

FOURTH STANDARD PARALLEL NORTH

FIFTH AUXILIARY MERIDIAN EAST

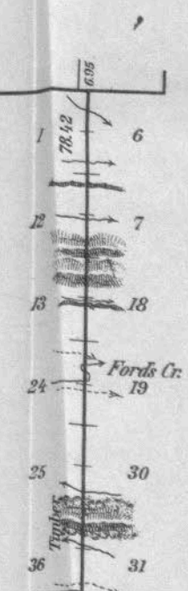
SIXTH AUXILIARY MERIDIAN EAST

T.16 N.
R.24 E.

T.13 N.
R.21 E.

T.13 N.
R.24 E.

THIRD STANDARD PARALLEL NORTH



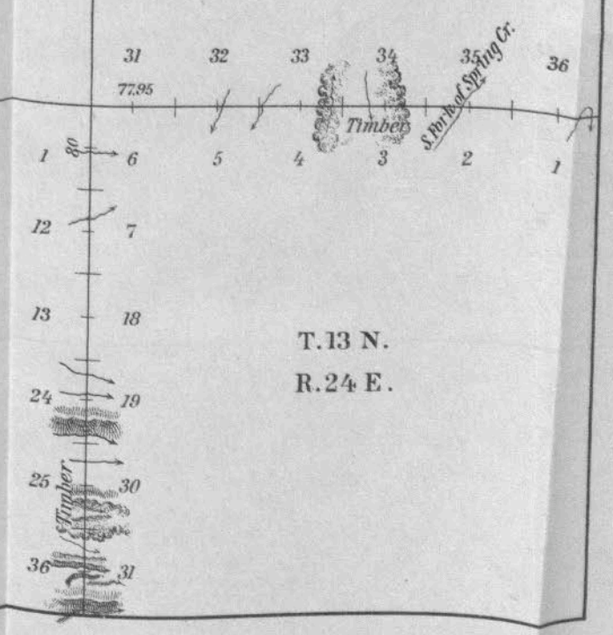
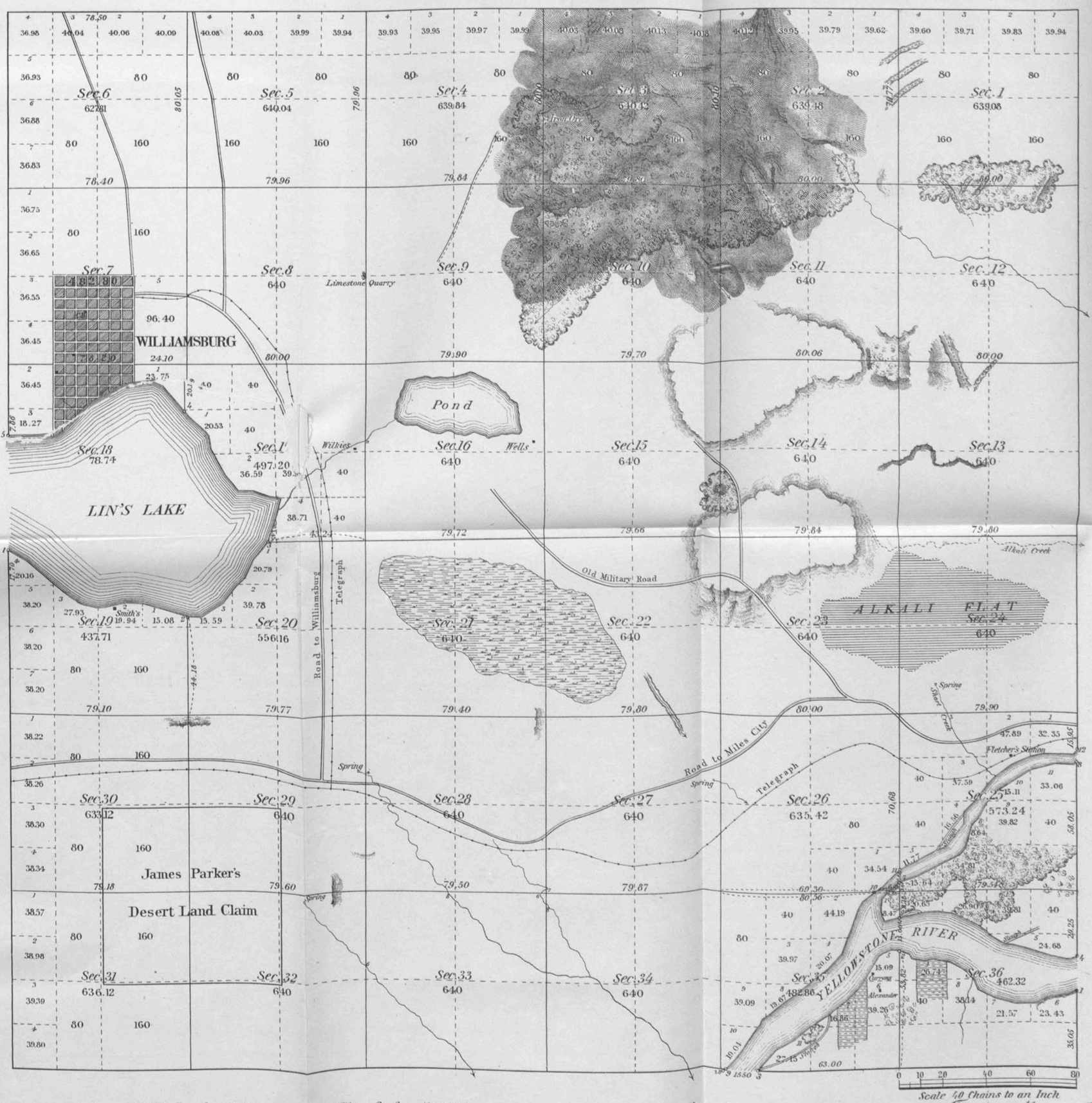


DIAGRAM B

TOWNSHIP Nº 6 NORTH RANGE Nº 34 EAST OF THE PRINCIPAL MERIDIAN MONTANA



Meanders of Yellowstone River									
Posts	Courses	Ch.s Lk.s	Posts	Courses	Ch.s Lk.s	Posts	Courses	Ch.s Lk.s
Right Bank Sec. 36			Sec. 25 Cont.d			Sec. 20 Cont.d		
				N. 61½° E.	17.00	3	N. 51¾° E.	3.30
1	S. 65¾° W.	4.00		N. 74¾° E.	11.00			
	S. 78¼° W.	7.40		S. 89¼° E.	6.50		Sec. 17	
	S. 63¾° W.	7.60	8	N. 54¾° E.	0.69			
	S. 89¾° W.	8.40				3	N. 20° E.	11.00
	N. 72¾° W.	10.00	Left Bank Sec. 35				N. 8½° E.	10.10
	N. 60° W.	7.60					N. 83½° E.	2.00
	N. 33¾° W.	4.70					N. 76° W.	2.30
	N. 50½° W.	7.80	9	N. 47° E.	2.80		N. 69¾° W.	7.00
	N. 60° W.	4.80		N. 37½° E.	6.30		N. 83¾° W.	6.10
	N. 72¾° W.	3.80		N. 31° E.	5.50		N. 53¼° W.	8.00
	N. 78½° W.	4.80		N. 31½° E.	6.40		N. 20¾° W.	14.00
	S. 77½° W.	3.50		N. 38¼° E.	7.10		N. 13¾° W.	6.80
	N. 80½° W.	5.00		N. 27° E.	2.70		N. 39° W.	2.30
	N. 71° W.	2.40		N. 53½° E.	4.00		N. 47¾° W.	6.00
	N. 25¾° W.	2.40		N. 47½° E.	4.90		N. 49¾° W.	5.00
	N. 71¾° W.	3.50		N. 51¼° E.	6.00		N. 55¾° W.	3.50
2	N. 76¾° W.	1.40		N. 54½° E.	12.00	4	N. 49¼° W.	0.20
				N. 52¾° E.	6.00			
Sec. 35				N. 47¾° E.	3.90		Sec. 18	
				N. 40¾° E.	8.50			
2	S. 86¾° W.	2.30		N. 28½° E.	7.60	4	N. 38¾° W.	15.00
	S. 75¾° W.	3.30		N. 31° E.	3.70		N. 63¾° W.	5.00
	S. 65° W.	2.30		N. 15¼° E.	9.20		S. 84° W.	13.00
	S. 35½° W.	11.00		N. 33¼° E.	3.80		S. 61½° W.	19.00
	S. 38¾° W.	5.60	10	N. 50¾° E.	6.42		S. 43° W.	13.00
	S. 46½° W.	9.00					S. 55½° W.	4.00
	S. 54½° W.	5.00	Sec. 26				S. 74¾° W.	4.70
	S. 44¼° W.	2.00					S. 85½° W.	5.60
	S. 65° W.	2.60	10	N. 59° E.	4.80	5	N. 88¼° W.	12.47
	S. 55¾° W.	8.70		N. 45½° E.	7.80			
	S. 55½° W.	2.80	11	N. 49° E.	2.05		Total Meanders	
	S. 48¾° W.	5.80					11 Ms: 46 Chs: 09 Lks	
	S. 56¾° W.	8.70	Sec. 25					
3	S. 40¾° W.	16.12						
			11	N. 65¾° E.	7.40			
Island in Secs. 25, 26, 35 & 36				N. 63¾° E.	5.30			
				N. 61¾° E.	12.00			
				N. 40¾° E.	5.60			
Sec. 36				N. 35° E.	7.70			
				N. 7¾° E.	2.50			
4	S. 70¾° W.	2.40		N. 1¾° W.	2.70			
	S. 86° W.	3.00		N. 41½° E.	9.00			
	N. 81° W.	8.50		N. 35° E.	1.70			
	N. 68½° W.	7.00		N. 41° E.	4.60			
	N. 73¾° W.	7.30		N. 40¾° E.	5.60			
	N. 84° W.	3.40		N. 54¾° E.	3.00			
	N. 61½° W.	1.50		N. 54° E.	3.00			
	N. 60¼° W.	3.50		N. 49¾° E.	2.60			
	N. 53¼° W.	2.50		N. 62¾° E.	11.30			
	N. 61¾° W.	2.60		N. 72° E.	5.70			
	N. 57¼° W.	4.90		S. 87¼° E.	13.00			
	N. 62¼° W.	8.20	12	N. 67¾° E.	0.80			
	N. 71¼° W.	4.80						
	N. 77¼° W.	5.80	Lin's Lake Sec. 19					
	N. 88½° W.	5.40						
	S. 80½° W.	9.60						
5	N. 88¾° W.	3.75	1	S. 59° E.	8.80			
				S. 46¾° E.	3.40			
Sec. 35				S. 44½° E.	2.40			
				S. 43¾° E.	5.70			
5	S. 79° W.	6.70		S. 43° E.	4.40			
	N. 15¾° W.	3.90		S. 46½° E.	5.80			
	N. 7¼° W.	3.40		S. 52¾° E.	5.80			
	N. 17½° E.	3.80		S. 53¾° E.	4.50			
6	N. 50° E.	2.39		S. 70½° E.	5.50			
				S. 75¾° E.	3.00			
Sec. 26				S. 88½° E.	4.00			
				N. 78° E.	9.60			
6&7	S. 52¾° E.	6.05		S. 88½° E.	6.50			
				S. 72½° E.	6.70			
Sec. 25				S. 71¾° E.	14.00			
			2					
7	N. 64° E.	2.50	Sec. 20					
	N. 69¾° E.	8.80						
	N. 63½° E.	9.40	2	N. 89° E.	6.20			
	N. 63¾° E.	9.10		N. 55¾° E.	11.50			
	N. 49° E.	4.30		N. 32½° E.	9.90			
	N. 33° E.	2.30		N. 48¾° E.	6.40			
	N. 13¾° E.	9.00		N. 31½° E.	5.00			
	N. 46½° E.	4.80		N. 24¾° E.	3.90			
	N. 27¼° E.	7.30		N. 22¾° E.	2.10			
	N. 34½° E.	4.70		N. 33° E.	2.40			
	N. 45½° E.	4.60		N. 32¼° E.	3.40			

Area of Public Land 21462.71 Acres, — of Water Surface 1310.96 Acres, — of Town Site 207.10 Acres. — Total number of Acres = 22980.77

Surveys Designated	By Whom Surveyed	Date of Contract	Amount of Surveys			When Surveyed	Mean Declination
			Ms	Chs	Lks		
Township Lines							
Subdivisions	Walter W. de Lacy	March 22nd 1879	57	26	99	Aug. 6th to 16th 1880	18° 37' 30"
Meanders	"	"	11	46	09	"	

The above Map of Township No 6 North, of Range No 34 East of the Principal Meridian, Montana, is strictly conformable to the field notes of the survey thereof on file in this Office which have been examined and approved

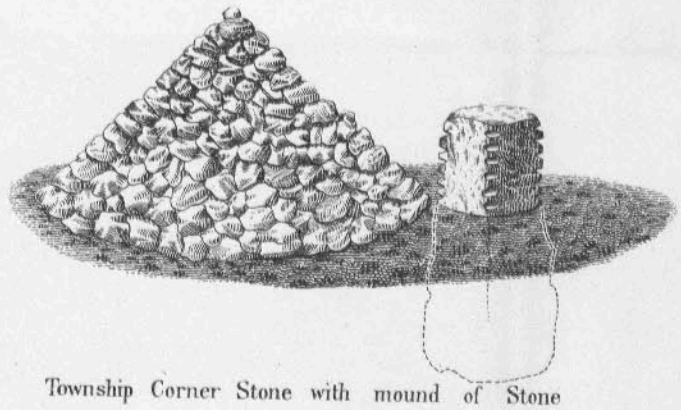
Surveyor Generals Office

Surv Gen.t

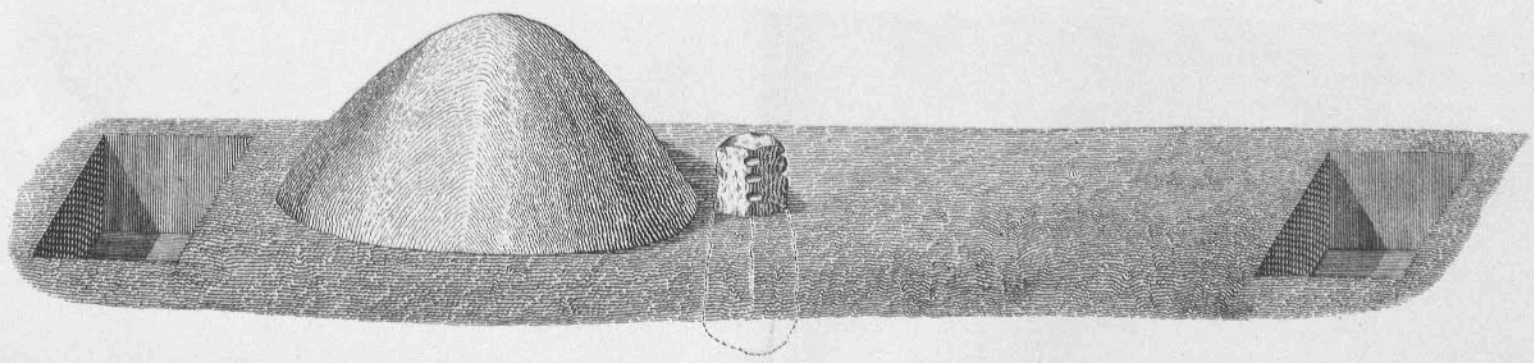
Sheet N°1

DIAGRAM C

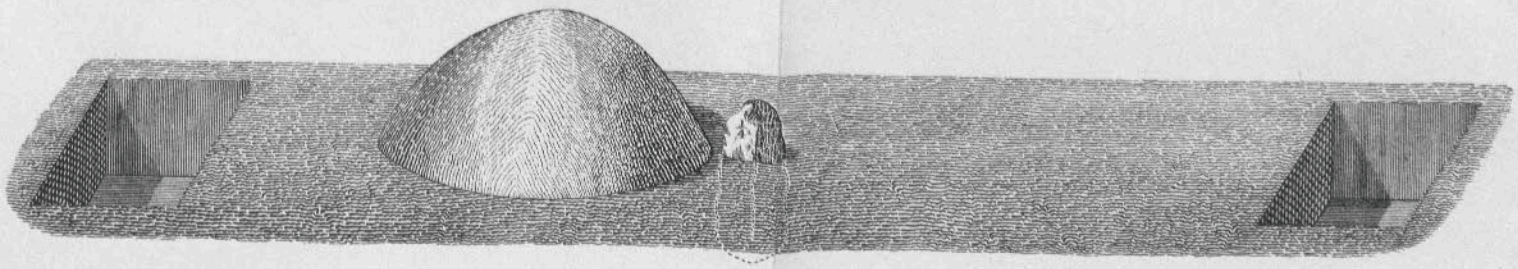
Illustrating mode of establishing Stone, Post and Mound Corners



Township Corner Stone with mound of Stone



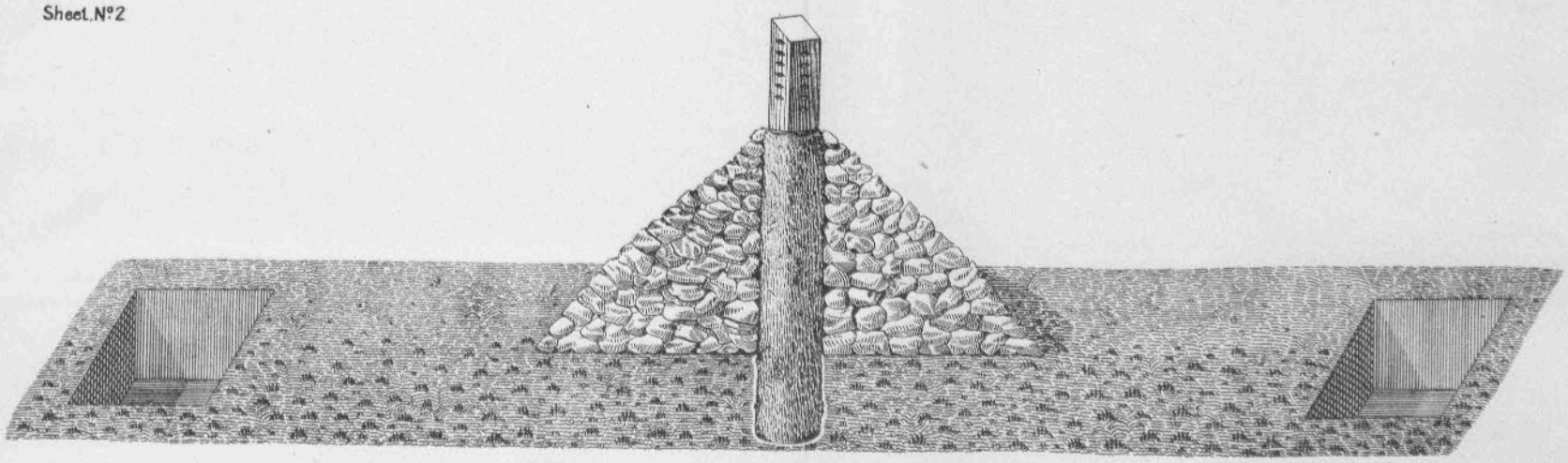
Section Corner Stone with pits and mound of earth



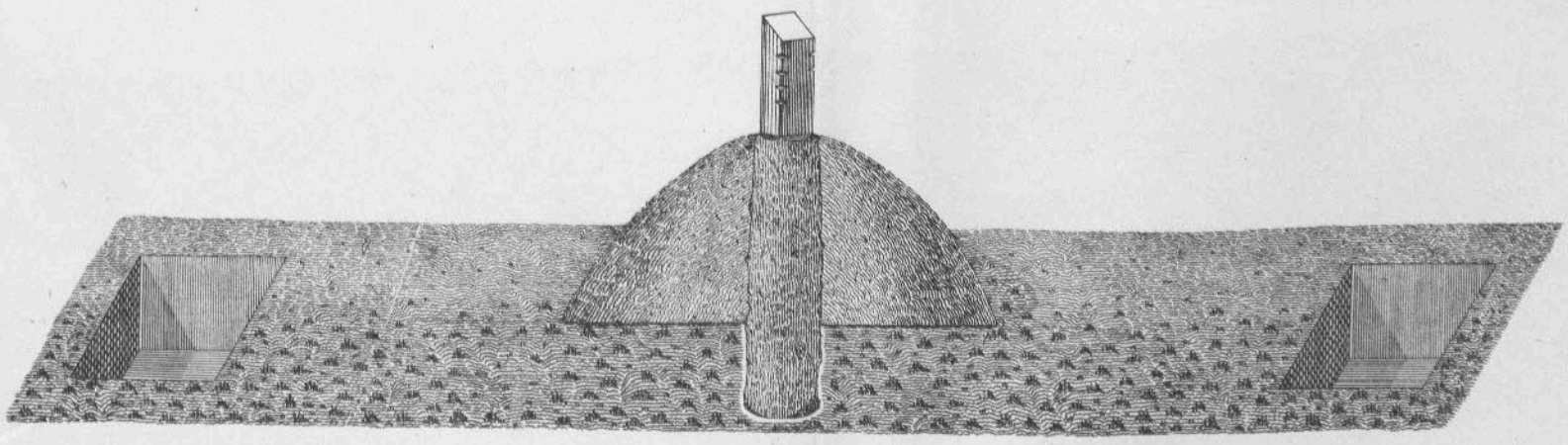
Quarter Section Corner with mound of earth

Sheet. N°2

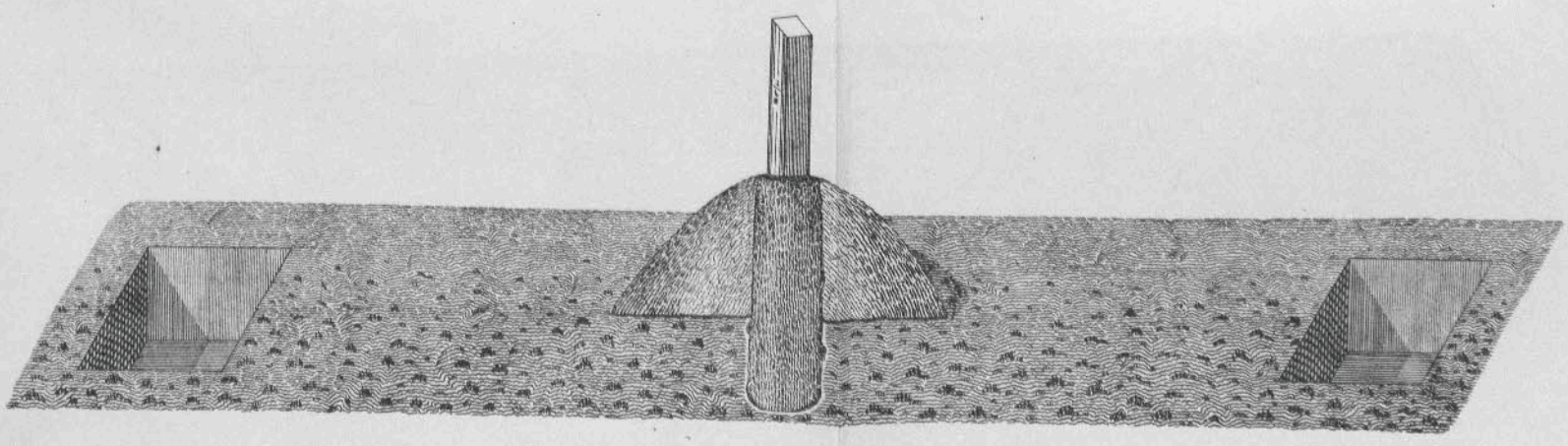
DIAGRAM C



Township Corner Post on Standard Line with mound of stone



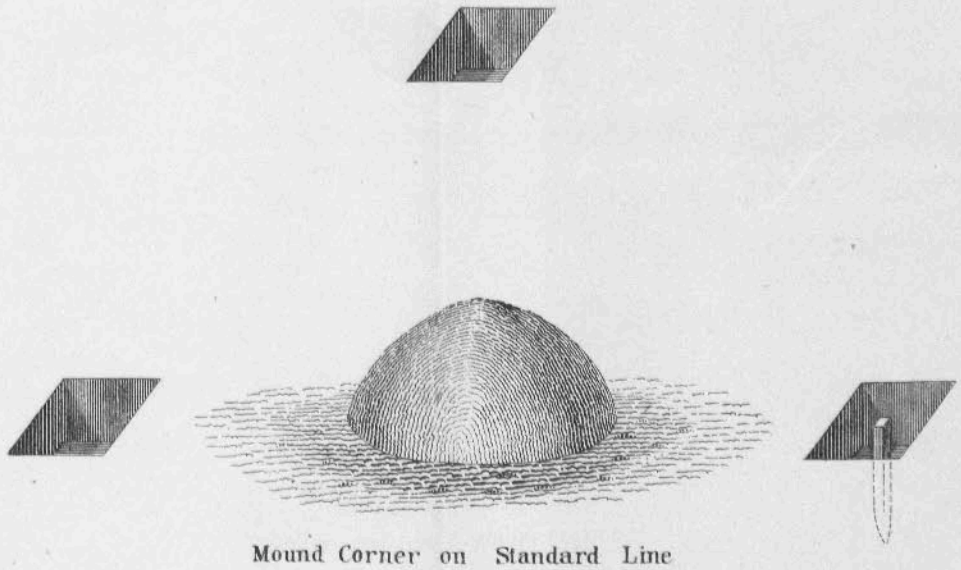
Section Corner Post with mound of earth



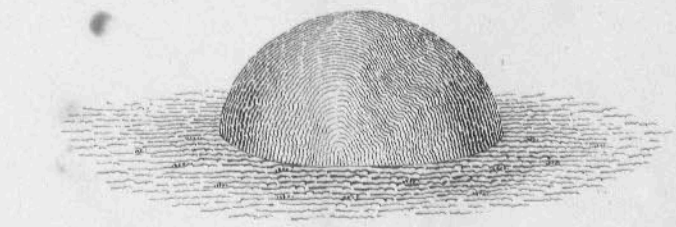
Quarter Section Corner Post with mound of earth

Sheet Nº 3

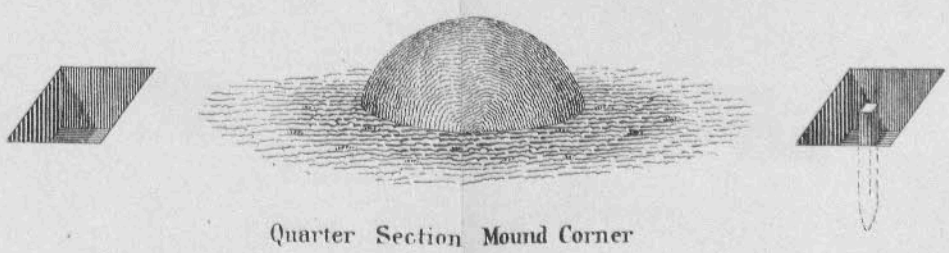
DIAGRAM C



Mound Corner on Standard Line



Mound Corner Common to 4 Sections



Quarter Section Mound Corner