

Accepted G. L. O. letter "E." April 28-1913.

661

4-679.
Exterior

2371

FEB. 24. 1913

Book J

BOOK 2371

FEB. 7-1912

FIELD NOTES

OF THE SURVEY OF THE

W and N Boundaries T17N R19W
 W. Ad. for. N " T18N. R19W
 " " " " " T19N. R19W.

Of the Delaware Sect. 36 Parish Meridian,
Arizona

AS SURVEYED BY

William P. Anderson, United States Deputy Surveyor,

Under his Contract No. 156, dated May 26, 1909.

Survey commenced November 20, 1911.

Survey completed January 3, 1912.

NAMES AND DUTIES OF ASSISTANTS.

David J. Moss Chairman

Louise Van Marter "

R. H. S. Swoot "

B. T. Whipplester "

E. Westover Roundman

Laura Skelton "

Chas. Clayton Organ

Jack Ray "

W. J. Nations Flagman

~~12~~ | ~~12~~¹³ | ~~13~~ | ~~13~~ Exterior Book "A"
 10+11 6 5 4 3
 10 7
 9+10 18
 T. 18 N. R. 19 W.
 9 19
 8+9 30
 8 31
 4

19
 18 6
 17 7
 16+17 18
 T. 19 N.
 16 19 R. 19 W.
 16 30
 15 31
 12

68
18

BOOK 2371

INDEX DIAGRAM.

Township 17 N, Range 19 W

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Orig. & Supplemental Standard Book "C"
 5th Guide Meridian West

4th Standard Parallel North
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1069
BOOK 2371

PRELIMINARY OATHS OF ASSISTANTS.

WE, David J. Moss and Robt. G. Sweet
Lonie Van Mantee and B.P. Wulfersten

do solemnly swear that we will well and faithfully execute the duties of chainmen; 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 distances 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

Township extension of T's 17, 18, 19 + 20 N R 19 W; T 17 + 18 N R 18 W.
David J. Moss Robt G. Sweet Chainman.
Lonie Van Mantee B.P. Wulfersten Chainman.

Subscribed and sworn to before me this 24th
day of November, 1911

William P. Alexander
U.S. Deputy Surveyor

WE, E. Weston and Laurance Skoler

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

Extensions of T's 17 + 18 N R's 18 + 19 W, + T's 19 + 20 N R 19 W.
E. Weston Moundman.
Laurance Skoler Moundman.

Subscribed and sworn to before me this 24th
day of November, 1911

William P. Alexander
U.S. Deputy Surveyor

WE, Chas Clayton and Jack Ray

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, to the best of our skill and ability, in the survey of

Extensions of T's 17 + 18 N R 18 + 19 W and T's 19 + 20 N R 19 W
Chas Clayton Axman.
Jack Ray Axman.

Subscribed and sworn to before me this 24th
day of November, 1911

William P. Alexander
U.S. Deputy Surveyor

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

Extensions of T's 17 + 18 N R's 18 + 19 W and T's 19 + 20 N R 19 W.
W J Nations Flagman.

Subscribed and sworn to before me this 24th
day of November, 1911

William P. Alexander
U.S. Deputy Surveyor

Chains .

Survey commenced November 30, 1911, and was executed with a Young and Sons Light Mountain Transit No. 7520, the horizontal limb having two double verniers placed opposite to each other, and reading to single minutes of arc, which is also the least reading of the Smith Solar attachment latitude and declination arcs with which this instrument is fitted.
 The instrument was examined, tested on the true meridian at Phoenix, Arizona, found correct, and was approved by the U. S. Surveyor General of Arizona, June 25, 1904.
 I examine all the standard and bubble adjustments of the instruments, and find them to be correct.
 I begin at the Standard corner of T. 17 N., R. 19 and 20 W. on Fourth Standard Parallel North, which is a lava stone 6 ins. above ground, marked and witnessed as described by the Surveyor General; latitude, 34°48'44" N., and long. 114° 18'46" W.; thereon I set the instrument.

At 2h.53m.a.m., 1.m.t., I observe Polaris at its western elongation, and mark the line thus secured by a tack driven in a stake set firmly in the ground about 5 chs.N. of my station.

At 6h.00m.a.m., 1.m.t., I turn off 1°25' to the east, and mark this line by a tack driven in a stake set east of the stake set this morning by Polaris observation.

At 8h.0m. a.m., 1.m.t., I set off 21°29'S. on the decl. arc; 34°48½' N. on the lat. arc, and determine a meridian with the solar; this line practically coincides with the stellar meridian.

Thence I run, North on W. bdy. of Tp. 17 N., R. 19 W., between secs. 31 and 36.

Over rolling land, covered with malpais boulders and dense undergrowth of greasewood and cactus.

- 1.00 Wash, 50 lks. wide, course W. Ascend.
 - 15.00 Descend.
 - 19.60 Wash, 20 lks. wide, course SW. Ascend.
 - 29.50 Ridge, bears E. and W. Descend.
 - 40.00 Set a malpais stone 6x8x15 ins., 12 ins. in the ground for the ¼ sec. cor., marked ¼ on the W. face, and raise a mound of stones 3 ft. base, 1½ ft. high, W. of cor. Pits impracticable.
 - 47.00 Wash, 15 lks. wide, course SWW.
 - 59.00 Wash, 100 lks. wide, course SWW.
 - 61.70 Wash, 100 lks. wide, course SWW.
 - 64.70 Wash, 50 lks. wide, course SWW.
 - 68.30 Wash, 100 lks. wide, course SWW.
 - 69.90 Ascend.
 - 74.80 Ridge, bears SWW. and NEE. Descend.
 - 80.00 Set a malpais stone 6x8x15 ins., 10 ins. in the ground for the cor. of secs. 25, 30, 31 and 36, marked with 1 notch on the S. and 5 notches on the N. edges, and raise a mound of stones 3 ft. base, 1½ ft. high, W. of cor. Pits impracticable.
- Land, rolling, covered with malpais boulders.
 Soil, 3rd rate, stony.
 Dense undergrowth of greasewood and cactus.
 No grass.
 Land, covered with dense undergrowth and malpais boulders, and exceptionally difficult to survey, 80.00 chains.

 Thence I run, North, between secs. 25 and 30.

- 26.20 Wash, 50 lks. wide, course SW. Ascend.
- 33.70 Top of canyon bank, course SW. Thence over rolling land.
- 40.00 Set a malpais stone 6x8x12 ins., 8 ins. in the ground for the ¼ sec. cor., marked ¼ on the W. face, and raise a mound of stones 3 ft. base, 1½ ft. high, W. of cor. Pits impracticable.
- 80.00 Set a malpais stone 6x8x14 ins., 10 ins. in the ground

Chains.

for the corner of secs. 19, 24, 25 and 30, marked with 4 notches on the N. and 2 on the S. edges, and raise a mound of stones 3 ft. base, $1\frac{1}{2}$ ft. high, W. of cor. Pits impracticable.

Land, rolling.

Soil, rocky, 3rd rate.

Surface covered with malpais boulders.

Dense undergrowth of greasewood and cactus.

Land, covered with dense undergrowth and boulders, and exceptionally difficult to survey, 80.00 chains.

At noon, I set off $21^{\circ}33'$ S. on the decl. arc, and observe the sun on the meridian at the above cor.; the resulting lat. reading is $34^{\circ}50\frac{1}{2}'$ N..

Thence I run,

North, between secs. 19 and 24.

Over rolling land, covered with large malpais boulders, and dense greasewood and cactus undergrowth.

40.00 Set a malpais stone $6 \times 8 \times 12$ ins., 8 ins. in the ground for the $\frac{1}{4}$ sec. cor., marked $\frac{1}{4}$ on the W. face, and raise a mound of stones 3 ft. base, $1\frac{1}{2}$ ft. high, W. of cor.

Pits impracticable.

80.00 Set a malpais stone $12 \times 14 \times 20$ ins., 15 ins. in the ground, for cor. of secs. 13, 18, 19 & 24, mkd. 3 notches on N. & S. edges, & raise a mound of stones 3 ft. base, $1\frac{1}{2}$ ft. high, W. of cor.

Pits impracticable.

80.00 Land, rolling, covered with black malpais boulders.

Soil, 3rd rate, stony.

Dense undergrowth of greasewood and cactus.

No grass.

Land, covered with dense undergrowth and boulders and exceptionally difficult to survey, 80.00 chs.

Thence I run,

North, between secs. 13 and 18.

Over mountainous land, covered with boulders and loose rock, and dense undergrowth of greasewood and cactus.

3.00 Descend south wall of Warm Springs Canyon, SW.

10.00 South bank of Warm Springs Canyon wash, course SW.

14.50 North bank of Warm Springs Canyon wash, course SW.

Ascend.

40.00 Set a malpais stone $6 \times 8 \times 14$ ins., 10 ins. in the ground for the $\frac{1}{4}$ sec. cor., marked $\frac{1}{4}$ on the W. face, and raise a mound of stones 3 ft. base, $1\frac{1}{2}$ ft. high, W. of cor.

Pits impracticable.

Continue ascent over boulders.

80.00 Set a malpais stone $7 \times 11 \times 15$ ins., 10 ins. in the ground for the cor. of secs. 7, 12, 13 and 18, marked with two notches on the N. and 4 notches on the S. edges, and raise a mound of stones 3 ft. base, $1\frac{1}{2}$ ft. high, W. of cor.

Pits impracticable.

Land, mountainous and covered with black malpais boulders;

Soil, 3rd rate, stony.

Dense greasewood and cactus undergrowth.

No grass.

Mountainous land, covered with dense undergrowth and boulders, and exceptionally difficult to survey, 80.00 chains.

At 4h. 0m. p.m., 1.m.t., at the above cor., I set off $34^{\circ}52'$ N. on the lat. arc; $21^{\circ}32'$ S. on the decl. arc, and determine a meridian with the solar; this coincides with the line I am running and demonstrates, by afternoon observation the correctness of my solar.

Thence I run,

North between secs. 7 and 12.

Over mountainous land, covered with boulders and loose

West boundary of Township 17 North, Range 19 West. 3.

Chains.

Rock.
 29.00 Ridge, bears E. and W. Descend.
 38.00 Rocky gulch, 10 lks. wide, course SE. Ascend.
 40.00 Set a malpais stone 6x10x12 ins., 8 ins. in the ground for the $\frac{1}{4}$ sec. cor., marked $\frac{1}{4}$ on the W. face, and raise a mound of stones 3 ft. base, $1\frac{1}{2}$ ft. high, W. of cor. Pits impracticable.
 Ascend over high bluffs.
 50.00 High ridge, bears SSE. and NNW. Descend cliffs.
 70.20 Wash, 30 lks. wide, course SE, in rocky gorge; ascend.
 80.00 Set a porphyry stone 6x8x12 ins., 8 ins. in the ground for the cor. of secs. 1, 6, 7 and 12, marked with 1 notch on the N. and 5 notches on the S. edges, and raise a mound of stones 3 ft. base, $1\frac{1}{2}$ ft. high, W. of cor. Pits impracticable.
 Land, extremely mountainous, and covered with loose rock. Soil, 4th rate, rocky.
 Scattering greasewood and cactus brush. No grass.
 Mountainous land, and land covered with loose rock, and exceptionally difficult to survey, 80.00 chs.
 November 30, 1911.

December 1, 1911.

Thence I run,

North, between secs. 1 and 6.

Over extremely mountainous land, covered with loose rock. Ascend.

5.00 Spur, bears W. Descend.
 40.00 Set a malpais stone 6x8x14 ins., 10 ins. in the ground for the $\frac{1}{4}$ sec. cor., marked $\frac{1}{4}$ on the W. face, and raise a mound of stones 3 ft. base, $1\frac{1}{2}$ ft. high, W. of cor. Pits impracticable.
 Ascend.
 45.00 Sharp ridge, bears E. and W. Descend.
 50.00 Wash, 10 lks. wide, course E. in gulch. Ascend.
 53.60 Wash, 15 lks. wide, course E. in gulch. Ascend.
 63.00 Descend.
 67.20 Wash, 20 lks. wide, course E. in gulch. Ascend.
 80.00 Set a quartz porphyry stone 12x12x20 ins., 15 ins. in the ground for the cor. of Tps. 17 and 18 N., Rs. 19 and 20 N., marked with 6 notches on all four edges, 18 N. on the NE. face, 17 N. on the SW. face, 20 W. on the NW. face, and 19 W. on the SE. face, and raise a mound of stones 3 ft. base, $1\frac{1}{2}$ ft. high, S. of cor. Pits impracticable.
 Land, extremely mountainous, covered with loose rock. Soil, rocky, 4th rate.
 Scattering greasewood and cactus undergrowth.
 Mountainous land, covered with loose rock and extremely difficult to survey, 80.00 chs.

4. North Boundary of Township 17 North, Range 19 West.

Chains.

I then proceed to the corner of Ts.17 and 18 N., Rs.18 and 19 W. on the Fifth Guide Meridian West, as recently reestablished and described by me.

At noon at this cor., I set off $21^{\circ}42\frac{1}{2}'S$ on the decl. arc, and observe the sun on the meridian. The resulting latitude is $34^{\circ}54'N$.

Thence I run,

West, on a random line, setting temp. $\frac{1}{4}$ sec. and sec. cors. at intervals of 40 and 80 chs. respectively.

240.00 Temp. cor. of secs. 3, 4, 33 and 34.

December 1, 1911.

December 2, 1911.

Thence I run,

West on a random line.

479.40 Intersect the west bdy. of the township, 42 lks. north of the cor. of Ts. 17 and 18 N., Rs. 19 and 20 W., recently established and described by me. This corresponds to a return bearing of $N.89^{\circ}57'E$.

Thence I run,

$N.89^{\circ}57'E$ on a true line on N. bdy. of Tp. 17 N., R. 19 W., between secs. 6 and 31.

Over extremely mountainous land, consisting of cliffs, bluffs and loose sliding rock.

Descend.

12.00 Wash, 10 lks. wide, course S. in gulch. Ascend.

20.00 Spur bears S. Descend.

24.60 Wash, 15 lks. wide, course SSW. in canyon. Ascend.

28.20 Ascend cliff about 100 feet high.

31.50 Rock spur bears N. Descend.

38.50 Rocky gorge, course NW. Ascend steep slope.

39.40 Set a porphyry stone, $6 \times 10 \times 20$ ins., 15 ins. in the ground for the $\frac{1}{4}$ sec. cor., marked $\frac{1}{4}$ on the north face, and raise a mound of stones 3 ft. base, $1\frac{1}{2}$ ft. high, N. of cor. Pits impracticable.

48.80 Narrow high rock ridge, bears N. and S. Descend cliffs.

58.70 Box canyon, 10 lks. wide, course S. Ascend.

74.00 High rock ridge, bears N. and S. Descend.

79.40 Point for sec. cor. falls on side of cliff, impracticable to perpetuate. I therefore proceed to

85.15 At base of cliff; set a porphyry stone $7 \times 10 \times 15$ ins., 10 ins. in the ground for the witness cor. to cor. of secs. 5, 6, 31 and 32, marked with 5 notches on the E, and 1 notch on the west edges, with W C on the NE face, and raise a mound of stones 3 ft. base, $1\frac{1}{2}$ ft. high, W. of cor. Pits impracticable.

Land extremely mountainous, and covered with loose sliding rock.

Soil, 4th rate, rock.

Very scattering undergrowth of cactus and greasewood.

Mountainous land, with cliffs and loose rock, and exceptionally difficult to survey, 80.00 chs.

Thence from true point for the section cor. $N.89^{\circ}57'E$, between secs. 5 and 32.

Descend over extremely mountainous land.

5.75 Pass of cliff and witness corner.

Continue steep descent, over sliding rock.

25.00 Ascend.

30.20 Top of butte; descend.

40.00 Set a granite stone $7 \times 13 \times 20$ ins., 15 ins. in the ground for the $\frac{1}{4}$ sec. cor., marked $\frac{1}{4}$ on the N. face, and raise a mound of stones 3 ft. base, $1\frac{1}{2}$ ft. high, N. of cor. Pits impracticable.

Continue descent.

47.00 Wash, 20 lks. wide, course SEE. Ascend.

50.00 Descend.

North boundary of Township 17 North, Range 19 West.

5.

Chains.

80.00 Set a malpais stone 7x12x24 ins., 18 ins. in the ground for the cor. of secs. 4, 5, 32 and 33, marked with 4 notches on the E. and 2 notches on the W. edges, and raise a mound of stones 3 ft. base, 1½ ft. high, W. of cor. Pits impracticable.

Land, extremely mountainous, and covered with loose rock. Scattering greasewood and cactus brush; no grass. Soil, 4th rate, stony.

Mountainous land, exceptionally difficult to survey, 80.00 chs.

At noon, at the above cor, I set off 21° 52' S. on the decl. arc, and observe the sun on the meridian. The resulting lat. reading is 34° 54' N.

Thence I run,
N. 89° 57' E., between secs. 4 and 33.
Descend.

6.80 Wash, 100 lks. wide, course S. in Warm Springs Canyon. Thence over flat, covered with dense catsclaw brush.

19.50 Leave flat and dense undergrowth; ascend over boulders.

40.00 Set a malpais stone, 10x12x18 ins., 12 ins. in the ground for the ¼ sec. cor., marked ¼ on the N. face, and raise a mound of stones 3 ft. base, 1½ ft. high, N. of cor. Pits impracticable.

44.00 Descend.

45.40 Spring brs. S. 500 lks.

47.80 Wash, 15 lks. wide, course S. Ascend.

54.80 Spur bears S. Descend.

59.30 Wash, 5 lks. wide, course S. Ascend.

61.30 Spur bears S. Descend.

64.75 Wash, 15 lks. wide, course SW. Ascend.

80.00 Set a malpais stone 6x9x20 ins., 15 ins. in the ground for the cor. of secs. 3, 4, 33 and 34, marked with 3 notches on the E. and W. edges, and raise a mound of stones 3 ft. base, 1½ ft. high, W. of cor. Pits impracticable.

Land, extremely mountainous, covered with loose rock and boulders; scattering greasewood, cactus and catsclaw undergrowth, 67.30 chs.

Dense catsclaw brush, 12.70 chains.

Soil, 4th rate, stony.

Small amount of grass.

Mountainous land, covered with loose rock and boulders, or land covered with dense undergrowth, and exceptionally difficult to survey, 80.00 chs.

Thence I run,
N. 89° 57' E., between secs. 3 and 34.
Over extremely mountainous land, covered with boulders and loose rock.
Ascend steep SW slope.

19.00 Descend.

40.00 Set a malpais stone 12x15x24 ins., 18 ins. in the ground for the ¼ sec. cor., marked ¼ on the N. face; and raise a mound of stones 3 ft. base, 1½ ft. high, N. of cor. Pits impracticable.

45.20 Wash, 30 lks. wide, course S. Ascend abruptly.

59.50 Spur bears S. Descend.

69.80 Wash, 10 lks. wide course S. in canyon. Ascend.

77.00 Spur bears SW. Descend.

80.00 Set a malpais stone 10x11x18 ins., 12 ins. in the ground for the cor. of secs. 2, 3, 34 and 35, marked with 2 notches on the E. and 4 notches on the W. edges. Pits impracticable.

Land, extremely mountainous, and covered with malpais boulders.

Scattering undergrowth of greasewood and cactus.

Soil, 4th rate, stony.

No grass.

6. North boundary of Township 17 North, Range 19 West.

Chains.

Mountainous land, covered with boulders, and exceptionally difficult to survey, 80.00 chs.

December 2, 1911.

December 3, 1911.

Thence I run,

N. 89° 57' E., between secs. 2 and 35.

Over extremely mountainous land, covered with malpais boulders.

Descend.

38.00 Wash, 20 lks. wide, course SW. in prominent canyon.

Ascend.

40.00 Malpais boulder in place 14x16x12 ins., above ground for the $\frac{1}{4}$ sec. cor., marked with a cross (x) at the exact point for the $\frac{1}{4}$ sec. cor. $\frac{1}{4}$ on the N. face, and raise a mound of stones 3 ft. base, 1 $\frac{1}{2}$ ft. high, N. of cor. Pits impracticable.

Continue ascent over boulders.

75.00 Descend.

80.00 Set a malpais stone 4x12x20 ins., 15 ins. in the ground, marked with 1 notch on the E. and 5 notches on the W. edges, and raise a mound of stones, 3 ft. base, 1 $\frac{1}{2}$ ft. high, W. of cor. Pits impracticable.

Land, extremely mountainous, covered with boulders.

Soil, 4th rate, rocky.

Scattering greasewood and cactus brush.

No grass.

Mountainous land, covered with boulders, and exceptionally difficult to survey, 80.00 chs.

At 9h. 0m., a.m., 1 m.t., at the above cor., I set off 21° 59' S. on the decl. arc; 34° 54' N. on the lat. arc, and determine a meridian with the solar.

Thence I run,

N. 89° 57' E., between secs. 1 and 36.

Over extremely mountainous land, covered with boulders.

Descend SE. slope.

16.00 Wash, 15 lks. wide, course SW., in canyon. Ascend.

40.00 Set a malpais stone 8x10x18 ins., 12 ins. in the ground for the $\frac{1}{4}$ sec. cor., marked $\frac{1}{4}$ on the N. face, and raise a mound of stone 3 ft. base, 1 $\frac{1}{2}$ ft. high, N. of cor. Pits impracticable. $\frac{1}{4}$ cor. near the top of high spur, SW.

42.00 Point of spur, bears SWW.; thence S. slope of same.

65.00 Descend.

80.00 Cor. of Ts. 17 and 18 N., Rs. 18 and 19 W., on 5th Guide Meridian West, recently reestablished and described by me.

Land, extremely mountainous, and covered with boulders and loose rock.

Soil, 4th rate, rocky.

A small amount of grass.

Scattering undergrowth of greasewood and cactus.

Mountainous land, covered with loose rock and boulders, and exceptionally difficult to survey, 80.00 chs.

December 3, 1911.

North Boundary of Township 17 North, Range 19 West.

Boundaries of Township 17 North, Range 19 West.
Latitudes, departures, and Closing errors.

Line designated.	True bearing.	Dist.	Latitudes.		Departures.	
			N.	S.	E.	W.
4th. Stand. Par. North,	West,	480.00				480.00
5th. Guide Mer. West,	S. 0° 03' E.	479.64	479.64		.42	
North Bay.	N. 89° 57' E.	479.40	.42		479.40	
West bdy.	North,	480.00	480.00			
Convergency,					.50	
Totals,			480.42	479.64	480.32	480.00
			479.64		480.00	
Error in lat.,			0.78		0.32	
Error in dep.,						

GENERAL DESCRIPTION.

This township is rough and mountainous over practically its entire area, and covers the southwest flank of the Ute Mountains, better known as the Black Mountains. The northeast two-thirds of the township is exceptionally rough, and is covered in at large part with loose sliding rock and malpais boulders. There is no timber, but little grass, and no water, except a small warm spring situated in section 4 near the north boundary of the township. The formation consists of eruptive and greatly altered sedimentary rocks. The soil is nearly all 4th rate, rocky.

William P. Alexander
U. S. Deputy Surveyor.

December 3, 1911.

8. West boundary of Township 18 North, Range 19 West.

Chains.

Survey commenced December 16, 1911, and was executed with a Young and Sons' Light Mountain Transit No. 7520; the horizontal limb having two double verniers placed opposite to each other, and reading to single minutes of arc.

The instrument was examined, tested on the true meridian at Phoenix, Arizona, found correct, and was approved by the U. S. Surveyor General for Arizona, June 25, 1904.

I commence at the cor. of Ts. 17 and 18 N., Rs. 19 and 20 W., which is a granite porphyry stone 12x12x15 ins. above ground, recently established and described by me.

I mark a cross (x) on this stone, and set the instrument up over it. At 1h.50m. a.m., l.m.t., I observe Polaris at its western elongation, and mark the line thus determined by a tack driven in a wooden peg set in the ground 5 chs. North of my station. All in accordance with the Manual.

At 6h.0m. a.m., l.m.t., I turn off 1°25½' to the east, which is the azimuth of Polaris, and mark the true meridian thus determined by driving a tack in a stake set in the ground east of the point established early this morning.

The magnetic bearing of the said true meridian is N. 15° 15' W., which gives the magnetic declination 15° 15' E.

At this station, I run, North on west boundary of Tp. 18 N., R. 19 W., between secs. 31 and 36.

Over mountainous land, covered with loose rock, and scattering greasewood and cactus brush.

- 5.00 Descend.
 - 8.00 Rocky gorge course E. Ascend.
 - 14.14 Rock ridge, bears E. and W. Descend.
 - 26.00 Wash, 20 lks. wide, course E. in canyon. Ascend.
 - 29.50 Base of cliff. Set a porphyry stone, 6x10x16 ins., 11 ins. in the ground for the witness corner of the ¼ sec. cor. bet. secs. 31 and 36, marked ¼ on the W. face, and W.C. on the NE. side, and raise a mound of stones 3 ft. base, 1½ ft. high, W. of stone. Pits impracticable.
 - Ascend steep bluffs and loose sliding rock.
 - 35.00 Spur-brs. W. Imprac. loc. for W.C. on account of sliding rock Desc.
 - 40.00 Point for ¼ sec. cor. falls on steep slide facing N. Impractical to establish on account of sliding rock.
 - 43.00 Rocky gorge course W. Ascend 45° slope of sliding rock and cliffs, bear E. and W.
 - 59.00 Top of high, sharp hog back rock, bears E. and W. Descend.
 - 73.00 Wash, 20 lks. wide, course W. in canyon. Ascend.
 - 80.00 Set a porphyry stone 6x10x15 ins., 10 ins. in the ground for the cor. of secs. 25, 30, 31 and 36, marked with 1 notch on the S. and 5 notches on the N. edges; and raise a mound of stones 3 ft. base, 1½ ft. high, W. of cor. Pits impracticable.
- Land extremely mountainous, and covered with loose rock. Soil, 4th rate, rocky. Scattering greasewood and cactus brush. No grass. Mountainous land, covered with loose rock, and exceptionally difficult to survey, 80.00 chs.

At 9h.0m. a.m., l.m.t. at the above cor., I set off 34° 55' N. on the lat. arc; 23° 15½' S. on the decl. arc, and determine a meridian with the solar. This line coincides exactly with the stellar meridian line upon which I have been running.

Thence I run, North, between secs. 25 and 30. Over extremely mountainous land, covered with loose rock, scattering greasewood and cactus brush. Ascend.

- 1.50 Rock ridge, bears E. and W. Descend.

West boundary of Township 18 North Range 19 West.

9.

Chains.	
5.70	Rocky gorge course west; ascend.
9.00	Saddle. Descend.
32.00	Wash, 10 lks. wide, course W. in rocky gorge. Ascend.
40.00	Set a tufa stone, 6x8x14 ins., 10 ins. in the ground for the $\frac{1}{4}$ sec. cor., marked $\frac{1}{4}$ on the W. face; and raise a mound of stones 3 ft. base, 1 $\frac{1}{2}$ ft. high, W. of cor. Pits impracticable.
49.20	High ridge, bears E. and W. Descend.
79.00	Set a porphyry stone 8x8x14 ins., 10 ins. in the ground for a witness corner to corner of secs 19, 24, 25 and 30, marked with 2 notches on the S, and 4 notches on the N. edges, W. C. on the NE. face, and raise a mound of stones 3 ft. base, 1 $\frac{1}{2}$ ft. high, W. of cor. Pits impracticable.
80.00	True point for corner of secs 19, 24, 25 and 30, falls in wash 60 lks. wide, course SWW. Impracticable to perpetuate the corner at this point. Land, extremely mountainous, covered with loose rock. Soil, 4th rate, stony; scattering greasewood and cactus brush. No grass. Mountainous land covered with loose rock, and exceptionally difficult to survey, 80.00 chs.

	From true point for the cor. of secs. 19, 24, 25 and 30, I run, North, bet. secs. 19 and 24. Over extremely mountainous land, covered with loose rock, scattering greasewood, cactus, and some catsclaw. Ascend over boulders.
40.00	Set a malpais stone, 10x12x15 ins., 10 ins. in the ground for the $\frac{1}{4}$ sec. cor., marked $\frac{1}{4}$ on the W. face; and raise a mound of stones, 3 ft. base, 1 $\frac{1}{2}$ ft. high, W. of cor. Pits impracticable.
	Continue steep ascent over loose rock.
63.00	Ascend 40 ft. bluff, E. and W.
70.00	Ridge, bears E. and W. Descend.
80.00	Set a malpais stone 6x8x14 ins., 10 ins. in the ground for the cor. of secs 13, 18, 19 and 24, marked with 3 notches on the S. and N. edges, and raise a mound of stones 3 ft. base, 1 $\frac{1}{2}$ ft. high, W. of corner. Pits impracticable. Land, extremely mountainous, covered with loose rock and boulders; scattering greasewood and cactus brush. Soil, 4th rate, stony. No grass. Mountainous land covered with loose rock, and exceptionally difficult to survey, 80.00 chains.

	At noon, at the above cor., I set off 23° 17' S. on the decl. arc, and observe the sun on the meridian. The resulting lat. reading is 34° 56 $\frac{1}{2}$ ' N. Thence I run, North between secs. 13 and 18. Descend over extremely mountainous land, covered with loose rock and boulders.
12.00	Wash, 10 lks. wide, course E. in gulch. Ascend.
16.00	Spur bears E. Descend.
34.00	Gulch, course E. 15 lks. wide. Ascend.
36.00	Spur, bears E. Descend.
38.00	Gulch, course E., 10 lks. wide. Ascend.
40.00	Set a malpais stone 10x10x16 ins., 11 ins. in the ground for the $\frac{1}{4}$ sec. cor., marked $\frac{1}{4}$ on the W. face, and raise a mound of stones 3 ft. base, 1 $\frac{1}{2}$ ft. high, W. of cor. Pits impracticable.
43.00	Spur bears E. Descend.
50.00	Ascend.
56.50	Ridge, bears E. and W. Descend.
72.00	Gorge full of rocks, course E. Ascend.

10. West boundary of Township 18 North, Range 19 West.

Chains.

80.00 Set a malpais stone 10x12x15 ins., 10 ins. in the ground for the cor. of secs. 7, 12, 13 and 18, marked with 2 notches on the E. and 4 notches on the S. edges, and raise a mound of stones 3 ft. base, 1½ ft. high, W. of cor. Pits impracticable.

Land, extremely mountainous.

Soil, 4th rate, stony.

Surface covered with boulders and loose rock.

Scattering greasewood and cactus brush.

No grass.

Mountainous land, covered with boulders and loose rock, and exceptionally difficult to survey, 80.00 chs.

At 4h. On p.m., 1 m. t., at the above cor., I set off 34°57½' N. on the lat. arc; 23°15'S. on the decl. arc, and determine a meridian with the solar. This line coincides with my stellar meridional line upon which I have been running.

December 16, 1911.

December 17, 1911.

Thence I run,

North, between secs. 7 and 12.

Over extremely mountainous land, covered with loose rock and boulders, scattering greasewood and cactus brush.

Descend.

10.00 Rocky gorge, course E. Ascend.

13.50 Spur bears E. Descend.

32.00 Wash, 60 lks. wide, course SE. in Warm Springs Canyon. Ascend.

40.00 Set a malpais stone 6x12x14 ins., 10 ins. in the ground for the ¼ sec. cor., marked ¼ on the W. face, and raise a mound of stones 3 ft. base, 1½ ft. high, W. of cor. Pits impracticable.

Continue steep ascent.

53.00 Top of cliffs at canyon rim.

Continue ascent.

60.00 Descend.

70.00 Draw, course E. Ascend.

80.00 Set a malpais stone 5x8x15 ins. 10 ins. in the ground for the cor. of secs. 1, 6, 7 and 12, marked with 5 notches on the S., and 1 notch on the N. edges, and raise a mound of stones 3 ft. base, 1½ ft. high, W. of cor. Pits impracticable.

Land extremely mountainous, covered with large malpais boulders and loose rock, scattering greasewood and cactus brush.

Soil, 4th rate, stony.

No grass.

Mountainous land, covered with boulders and loose rock, and exceptionally difficult to survey, 80.00 chs.

At 9h. On a.m., 1 m. t. at the above cor., I set off 23°18½' S. on the decl. arc; 34°58½' N. on the lat. arc, and determine a meridian with the solar.

Thence I run,

North, bet. secs. 1 and 6.

Over extremely mountainous land, covered with boulders and loose rock, scattering greasewood, cactus, and catsclaw brush.

Ascend.

7.75 Ridge, brs. E. and W. Descend.

18.00 Wash, 40.00 lks. wide, course SW. in canyon. Ascend.

40.00 Set a malpais stone 5x8x15 ins., 12 ins. in the ground for the ¼ sec. cor., marked ¼ on the W. face, and raise a mound of stones 3 ft. base, 1½ ft. high, W. of cor. Pits impracticable.

Ascend.

60.00 Ridge bears NE. and SW. Descend.

West boundary of Township 18 North, Range 19 West.

11.

Chains.

71.00

Wash 30 lks. wide, course SW. in canyon. Ascend.

80.00

Set a temp. township cor. to T_s. 18 and 19 N., R_s. 19 and 20 W.

Land, extremely mountainous, covered with boulders and loose rock, scattering greasewood and cactus brush.

No grass.

Soil, 4th rate, stony.

Mountainous land, covered with boulders and loose rock, and exceptionally difficult to survey, 80.00 chs.

Chains.

I then proceed to the $\frac{1}{4}$ sec. cor. between secs. 3 and 34, on the north boundary of the township previously established by me, which is a malpais stone 6x8x5 ins. above ground, marked and witnessed as described.

Thence I run,

West on a random line between secs. 34 and 3, 33 and 4, 32 and 5 and 31 and 6, setting temp. sec. and $\frac{1}{4}$ sec. cor. at intervals of 40 and 80 chains respectively to an intersection with the west bdy. of the Tp.

279.00 Intersect the W. bdy. of T. 18 N., R. 19 W. at a point 210 lks. south of the temp. township cor. set by me this day.

December 17, 1911.

December 18, 1911.

The falling of yesterday being 210 lks. south of the temp. township cor., at the intersection of my random north boundary of Tp. 18 N., R. 19 W., I establish the true cor. of Ts. 18 and 19 N., Rs. 19 and 20 W. at a point

77.90 North from cor. of secs. 1, 6, 7 and 12.

Set a porphyry stone 10x10x18 ins., 12 ins. in the ground for the cor. of Ts. 18 and 19 N., Rs. 19 and 20 W., marked with 6 notches on each edge, with 19 N. on the NE, 18 N. on the SW., 19 W. on the SE., and 20 W. on the NW. faces, and raise a mound of stones 3 ft. base, $1\frac{1}{2}$ ft. high, S. of cor. Pits impracticable.

Thence I run,

East on a true line on N. bdy. of T. 18 N., R. 19 W., between secs. 6 and 31.

Over mountainous land, covered with malpais boulders, scattering greasewood and cactus brush.

Descend.

7.00 Wash, 10 lks. wide, course SW. in rocky gulch, Ascend.

29.00 Ridge, brs. N. and S. Descend.

39.00 Set a malpais stone 10x12x20 ins., 15 ins. in the ground for the $\frac{1}{4}$ sec. cor., marked $\frac{1}{4}$ on the N. face, and raise a mound of stones 3 ft. base, $1\frac{1}{2}$ ft. high, N. of cor.

Pits impracticable.

Continue descent.

44.50 Wash, 25 lks. wide, course S. in canyon. Ascend.

65.00 Ridge, brs. N. and S. Descend.

79.00 Set a malpais stone, 12x12x20 ins., 15 ins. in the ground for the cor. of secs. 31, 32, 5 and 6, marked with 5 notches on the E. and 1 notch on the W. edges, and raise a mound of stones 3 ft. base, $1\frac{1}{2}$ ft. high, W. of cor. Pits impracticable.

Land, extremely mountainous.

Soil, 4th rate, stony.

Surface covered with malpais boulders, scattering greasewood and cactus brush.

Scattering dry grass.

Mountainous land, covered with boulders and exceptionally difficult to survey, 79.00 chs.

At 9h. Am., a.m., 1.m.t., at the above cor., I set off 23 $\frac{1}{2}$ 20 $\frac{1}{2}$ ' S. on the decl. arc; 34 $\frac{1}{2}$ 59' N. on the lat. arc, and determine a meridian with the solar.

Thence I run,

East, between secs. 5 and 32.

Over extremely mountainous land, covered with malpais boulders and scattering greasewood and cactus brush.

Descend.

5.00 Rocky gulch, course S. Ascend.

25.00 Ridge, brs. SE. and NW. Descend.

40.00 Set a malpais stone 10x12x18 ins., 12 ins. in the ground for the $\frac{1}{4}$ sec. cor., marked $\frac{1}{4}$ on the N. face, and raise a mound of stones 3 ft. base, $1\frac{1}{2}$ ft. high, N. of cor.

Pits impracticable.

North boundary of Township 13 North Range 19 West. 13.

Chains.

- 50.00 Draw, course S. Ascend.
 56.00 Rock ridge, bears SSE. and NNW. Descend very steep canyon wall.
 75.00 Witness corner, the true point for the cor. falls in wash, Set a sandstone rock, 6x11x22 ins., 17 ins. in the ground for a witness corner to cor. of secs. 4, 5, 32 and 33, marked W.C. on the NE. face, 4 notches on the E., and 2 notches on the W. edges, and raise a mound of stones, 3 ft. base, 1½ ft. high, W. of cor. Pits impracticable.
 80.00 Point for the cor. of secs. 4, 5, 32 and 33 falls in wash, 400 lks. wide, course SE. This corner point is about 2000 ft. below ¼ sec. cor., between secs. 32 and 5, in elevation.
 Land, extremely mountainous, and covered with sliding rock and boulders; scattering greasewood, cactus, and catslaw brush.
 Soil, 4th rate; stony.
 Very little grass.
 Extremely mountainous land covered with boulders and sliding rock, and exceptionally difficult to survey, 80.00 chs.

- From true point for cor. of secs. 4, 5, 32 and 33, I run, East, between secs. 4 and 33.
 Over extremely mountainous land, covered with boulders; scattering greasewood, cactus, and catslaw brush.
 Ascend SW. slope of mountain.
 40.00 Set a malpais stone 7x9x20 ins., 15 ins. in the ground for the ¼ sec. cor., marked ¼ on the N. face, and raise a mound of stones 3 ft. base, 1½ ft. high, N. of cor. Pits impracticable.
 Descend.
 59.00 Rocky gulch, course SSE. Ascend.
 71.50 Spur bears SW. Descend.
 76.00 Gully, course SW. Ascend.
 79.00 Spur bears S. Descend.
 80.00 Set a granite stone 8x10x15 ins., 10 ins. in the ground, for the cor. of secs. 3, 4, 33 and 34, marked with 3 notches on the E. and W. edges, and raise a mound of stones 3 ft. base, 1½ ft. high, W. of cor. Pits impracticable.
 Land, extremely mountainous, covered with boulders.
 Soil, 4th rate, stony; scattering greasewood and cactus brush.
 No grass.
 Mountainous land, covered with boulders and exceptionally difficult to survey, 80.00 chs.

- At noon, the sun is obscured by clouds, and a latitude observation is impracticable.
 Thence I run, East, between secs. 3 and 34.
 Over extremely mountainous land, covered with boulders, scattering greasewood and cactus brush.
 Descend.
 11.00 Gully, course SSE. Ascend.
 15.00 Spur bears S. Descend.
 21.00 Gully, course SSW. Ascend.
 29.50 Top of high rock ridge, bears N. and S. Descend steep mountain side covered with loose rock, and extremely difficult to negotiate.
 40.00 The ¼ sec. cor. between secs. 3 and 34 recently established and described by me.
 Land extremely mountainous, covered with loose rock and boulders.
 Soil, 4th rate, stony.
 Scattering greasewood and cactus.

14. North boundary of Township 18 North Range 19 West.

Chains

Mountainous land, covered with loose rock, and exceptionally difficult to survey, 40.00 chs.
December 18, 1911.

Boundaries of Township 18 North, Range 19 West.
Latitudes, departures and closing errors.

Line designated.	True bearing.	Dist.	Latitudes.		Departures.	
			N.	S.	E.	W.
South bdy.	S. 89° 57' W.	479.40		0.42		479.40
West bdy.	North,	477.90	477.90			
North bdy.	East,	479.00			479.00	
5th. Guide Mer.	S. 0° 3' E.	477.70		477.70	0.42	
Convergency,					0.51	
Totals,			477.90	478.12	479.93	479.40
				477.90	479.40	
Error in latitude				0.22		
Error in departure					0.53	

GENERAL DESCRIPTION.

This township is very rough and mountainous over its entire area, and covers the center and highest portions of the Uta Mountains. The surface is intersected by deep canyons two thousand feet in depth at places, and very rough. The whole area has been originally capped with malpais formation, which has broken down and eroded leaving large masses and ridges of boulders and sliding rock. The soil is probably about all 4th rate, stony, and thus far there has been no water found. There is no timber and but little grass. The brush consists of greasewood and cactus, with scattering yucca plants on the higher ground.

December 18, 1911.

William P. Alexander
U.S. Deputy Surveyor.

West boundary of Township 19 North, Range 19 West. 15.

Chains.

Survey commenced January 1, 1912, and was executed with a Young and Sons' Light Mountain Transit No. 7520, the horizontal limb having two double verniers placed opposite to each other and reading to single minutes of arc, which is also the least reading of the verniers of the latitude and declination arcs of the Smith solar attachment which is fitted to the instrument.

The instrument was examined, tested on the true meridian at Phoenix, Arizona, found correct, and approved by the U. S. Surveyor General, June 25, 1904.

I examine the bubble and standard adjustments of the instrument, and find them to be correct.

I commence at the cor. of Tps. 18 and 19 N., Rs. 19 and 20 W., recently established and described by me, situated in latitude $34^{\circ}59'10''N.$; longitude, $114^{\circ}18'46''W.$

At 4h. 0m. p.m., l.m.t., I set off $34^{\circ}59'N.$ on the lat. arc; $23^{\circ}0'8.$ on the decl. arc, and determine a meridian with the solar. I mark the line thus obtained by a tack driven in a stake set about 400 lks. N. of my station.

January 1, 1912.

January 2, 1912.

At 12h. 42m., a.m., l.m.t., I observe Polaris in accordance with the Instructions in the Manual, and mark the line of Polaris western elongation by a tack driven in a stake set about 400 lks. north of my station.

At 8h. 0m., a.m., l.m.t., I turn off $1^{\circ}25'$ to the east, and mark the true meridian thus obtained by a tack driven in the stake set yesterday afternoon by solar observation. This line runs about one-eighth of an inch to the east of my solar meridian.

At 9h. 0m., a.m., l.m.t., I set off $34^{\circ}59'N.$ on the lat. arc; $22^{\circ}58'8.$ on the decl. arc, and determine a meridian with the solar. This a.m. observation coincides with the stellar meridian. I conclude the solar attachment is in good adjustment. Magnetic variation is $15^{\circ}15'E.$ of the true meridian.

Thence I run, North, on a true line on west bdy. of Tps. 19 N., R. 19 W., bet. secs. 31 and 36.

Over extremely mountainous land, covered with boulders and loose rock; scattering greasewood and cactus brush.

- 4.00 Descend.
 - 15.00 Wash, 20 lks. wide, course SW. in canyon. Ascend.
 - 32.00 Spur bears E. Descend.
 - 35.00 Wash, 20 lks. wide, course SE. in canyon. Ascend.
 - 40.00 Set a porphyry stone 10x12x18 ins., 12 ins. in the ground for the $\frac{1}{4}$ sec. cor., marked $\frac{1}{4}$ on the W. face, and raise a mound of stones 3 ft. base, $1\frac{1}{2}$ ft. high, W. of cor. Pits impracticable.
 - 44.00 Wash, 20 lks. wide, course SW. in canyon. Ascend.
 - 53.00 Spur bears E. Descend.
 - 65.00 Gulch, course E. Ascend.
 - 80.00 Set a porphyry stone 6x8x14 ins., 10 ins. in the ground for the cor. of secs. 25, 30, 31 and 36, marked with 1 notch on the S. and 5 notches on the E. edges, and raise a mound of stones 3 ft. base, $1\frac{1}{2}$ ft. high, W. of cor. Pits impracticable.
- Land very mountainous and covered with boulders and loose rock.
- Soil, 4th rate, stony.
- Scattering greasewood and cactus, and catslaw brush.
- Scattering grass, dry.
- Mountainous land, covered with boulders and loose rock, and exceptionally difficult to survey, 80.00 chs.

Thence I run,

18 West boundary of Township 19 North, Range 19 West.

Chains.

North, between secs. 25 and 30.
Over extremely mountainous land, covered with boulders and loose rock.
Scattering greasewood and catsclaw, and cactus brush.

5.50 Wash, 30 lks. wide, course SW. in gulch.
Ascend.

10.00 Spur bears SW. Descend.

18.00 Wash, 10 lks. wide, course SW. in gulch; ascend.

33.00 Spur bears E. Descend.

35.00 Ascend.

40.00 Set a porphyry stone 6x3x15 ins., 10 ins. in the ground, for the $\frac{1}{4}$ sec. cor., marked $\frac{1}{4}$ on the W. face, and raise a mound of stones 3 ft. base, $1\frac{1}{2}$ ft. high, W. of cor. Pits impracticable.

Continue steep ascent, covered with loose rock.

54.00 Top of high mountain, bears E. and W. Descend steep slope.

63.00 Draw, course E. Ascend.

71.00 Descend cliffs 40 ft. high, bears E. and W.
Thence over steep descent, covered with loose rock and boulders.

80.00 Set a porphyry stone 10x12x15 ins., 10 ins. in the ground, for the cor. of secs. 19, 24, 25 and 30, marked with 2 notches on the S. and 4 notches on the N. edges, and raise a mound of stones 3 ft. base, $1\frac{1}{2}$ ft. high, W. of cor. Pits impracticable.

Land, extremely mountainous, and covered with loose rock and boulders.
Soil, 4th rate, stony.
Scattering greasewood and cactus brush.
No grass.
Mountainous land, covered with boulders, and loose rock and exceptionally difficult to survey, 80.00 chs.

At noon, at the above cor., I set off $22^{\circ}58'3''$ on the decl. arc, and observe the sun on the meridian. The resulting lat. reading is $35^{\circ}01' N.$

Thence I run,
North, bet. secs. 19 and 24.
Over extremely mountainous land, covered with boulders and loose rock; scattering greasewood and cactus brush.
Descend very steep and rough slope to the NNE.

11.00 Gorge course NE. Ascend.

17.00 Ridge, E. and W. Descend.

31.50 Ascend.

37.50 Spur, bears E. Descend.

39.50 Wash, 30 lks. wide, course E. in gorges. Ascend.

40.00 Set a porphyry stone 6x8x15 ins., 10 ins. in the ground for the $\frac{1}{4}$ sec. cor., marked $\frac{1}{4}$ on the W. face, and raise a mound of stones 3 ft. base, $1\frac{1}{2}$ ft. high, W. of cor. Pits impracticable. This $\frac{1}{4}$ sec. cor. is situated on the N. bank of the main deep canyon wash at an elevation of about 2000 feet below the sec. cor. 40 chs. S.

Thence ascend over loose rock a very steep slope.

80.00 On high E. and W. ridge. Set a malpais stone 12x14x18 ins., 12 ins. in the ground for the cor. of secs. 13, 18, 19 and 24, marked with 3 notches on the S. and 3 notches on the N. edges, and raise a mound of stones 3 ft. base, $1\frac{1}{2}$ ft. high, W. of cor. Pits impracticable.

Land, extremely mountainous, covered with loose rock and boulders.
Soil, 4th rate, stony.
Scattering greasewood and cactus undergrowth.
No grass.
Mountainous land, covered with loose rock and boulders, and exceptionally difficult to survey, 80.00 chs.

Thence I run,
North, between secs. 13 and 18.
Over extremely mduntainous land, covered with loose rock

Chains.

and boulders.
 Descend.
 Scattering greasewood and cactus brush.
 21.00 Wash, 10 lks.wide, course NE. in canyon. Ascend.
 23.00 Rocky ridge, bears E.and W.in Descend.
 28.00 Wash, 5 lks.wide, course NE. in canyon. Ascend.
 32.00 Descend.
 40.00 Set a porphyry stone 6x8x18 ins., 12 ins. in the ground for the $\frac{1}{4}$ sec.cor., marked $\frac{1}{4}$ on the W.face, and raise a mound of stones 3 ft. base, $1\frac{1}{2}$ ft. high,W.of cor. Pits impracticable.
 Ascend.
 41.30 Rock ridge, bears E.and W. Descend.
 68.00 Ascend.
 70.00 Ridge, bears E.and W. Descend.
 73.70 Wash, 15 lks.wide, course NE.in canyon. Ascend.
 75.00 Descend.
 80.00 Set a red granite stone 8x14x20 ins., 15 ins. in the ground for the cor.of secs. 7,12,13 and 18, marked with 2 notches on the N. and 4 notches on the S.edges, and raise a mound of stones 3 ft.base, $1\frac{1}{2}$ ft. high,W. of cor. Pits impracticable.
 Land, extremely mountainous, and covered with loose rock and boulders.
 Soil, 4th rate, stony.
 Scattering greasewood and cactus brush.
 No grass.
 Mountainous land, covered with boulders and loose rock, and exceptionally difficult to survey, 80.00 chs.
 January 2, 1912.

 January 3, 1912.

Thence I run,
 North, between secs. 7 and 12.
 Over extremely mountainous land, covered with boulders and loose rock.
 Descend:
 1.00 Wash, 5 lks.wide, course SEE. in gorge. Ascend.
 12.00 Rock ridge, bears E.and W. Descend.
 12.20 Power transmission line between Goldroads and Kingman, brs. E. and W.
 14.40 Pipe line between Little Meadows and Goldroads, brs.E. and W.
 14.70 Wagon road from Kingman to Goldroads, brs.E. and W.
 15.40 Telephone line brs.E. and W.
 16.00 Wash, 10 lks.wide, course E. in gorge. Ascend white sandstone in cliffs, abears E. and W.
 27.70 Top of cliffs bears E. and W. Continue ascent.
 35.00 Descend.
 40.00 Set a malpais stone 6x10x15 ins., 10 ins. in the ground for the $\frac{1}{4}$ sec.cor., marked $\frac{1}{4}$ on the W. face, and raise a mound of stones 3 ft.base, $1\frac{1}{2}$ ft. high,W. of cor. Pits impracticable.
 Ascend. U.S. L.M.No.1699 A. bears N.89°W $\frac{1}{4}$, 132.20 chs. dist $\frac{1}{4}$
 44.00 Ridge, brs. SE. and NW. Descend.
 52.00 Gulch, course SE.
 60.00 Spur brs. E. Descend.
 61.00 Ascend.
 64.00 Descend.
 70.00 Wash, 15 lks.wide, course SE. in canyon. Ascend.
 80.00 Set a malpais stone 10x12x20 ins., 15 ins. in the ground for the cor.of secs.1,6,7 and 12, marked with 1 notch on the N. and 5 notches on the S. edges, and raise a mound of stones 3 ft.base, $1\frac{1}{2}$ ft. high,W.of cor. Pits impracticable.
 Land, extremely mountainous, covered with boulders and loose rock.
 Soil, 4th rate, stony.
 Scattering greasewood and cactus brush.
 Scattering grass.
 Mountainous land covered with boulders and loose rock.

Chains.

and exceptionally difficult to survey, 80.00 chs.

At 9h. 0m. a.m., 1st met., I set off 35° 03 1/2' N. on the lat. a
arc; 22° 53' S. on the decl. arc, and determine a meridian
with the solar at the cor. of secs. 1, 6, 7 and 12, on the
W. bdy. of T. 19 N., R. 19 W.

Thence I run,
North, between secs. 1 and 6.
Over extremely mountainous land, covered with loose rock
and boulders; scattering greasewood and cactus brush.
Ascend.

- 5.50 Ridge, brs. E. and W. Descend.
- 17.50 Wash, 10 lks. wide, course SSE. in gulch. Ascend.
- 34.00 Descend.
- 39.00 Same gulch, course SW. Ascend.
- 40.00 Set a malpais stone 8x10x12 ins., 8 ins. in the ground
for the 1/4 sec. cor., marked 1/4 on the W. face, and raise
a mound of stones 3 ft. base, 1 1/2 ft. high, W. of cor.

Pits impracticable.
Ascend very steep slope.

- 50.00 Ridge, brs. E. and W. Descend.
- 55.70 Wash, 10 lks. wide, course west in gorge. Ascend.
- 62.00 Spur bears W. Descend.
- 73.00 Wash, 10 lks. wide, course SWW. in canyon. Ascend.
- 80.00 Ridge, E. and W. It being impracticable to establish the
north boundary of this township in the usual way on
account of the known mountainous and unsurveyable land
in and along the north boundary of secs. 4 and 5, I pro-
ceed to establish the northwest corner of the township
at a closing distance equal to that of the known and
previously described closing distance on the E. bdy. of
section 1.

- 81.12 Set a malpais stone, 10x10x26 ins., 20 ins. in the ground
for the cor. of Ts. 19 and 20 N., Rs. 19 and 20 W., marked
with 6 notches on the N., E., S. and W. edges; 20 N on
the NE., 19 W on the SE., 19 N on the SW., and 20 W. on
the NW. faces, and raise a mound of stones 3 ft. base,
1 1/2 ft. high, S. of cor. Pits impracticable.

Land, extremely mountainous, covered with loose rock and
boulders.

Soil, 4th rate, stony.
Scattering greasewood and cactus brush.
No grass.

Mountainous land, covered with loose rock and boulders, a
and exceptionally difficult to survey, 81.12 chs.

North boundary of Township 19 North, Range 19 West. 19. Chains.

It being impracticable to run the north boundary of this township in the usual way for reasons previously stated, I then proceed to run from the cor. of Ts. 19 and 20 N., Rs. 19 and 20 W., today established and described by me.

Thence east on a true line, bet. secs. 31 and 6. Over extremely mountainous land, covered with loose rock and boulders.

Descend along south bank of deep rugged canyon.

18.00 Wash, 10 lks. wide, course NW. in deep rocky gorge. Ascend.

37.00 Ascend cliffs, 50 ft. high, bear N. and S.

The closing distance of the last half mile to the west on the south boundary of this township is 39.00 chs.

Convergency in 6 miles is $\frac{.51}{38.49}$ chs.

Therefore at

38.49 I set a malpais stone 6x6x15 ins., 10 ins. in the ground for the $\frac{1}{4}$ sec. cor., marked $\frac{1}{4}$ on the N. face, and raise a mound of stones 3 ft. base, $1\frac{1}{2}$ ft. high, N. of cor. Pits impracticable.

Land becomes very mountainous and progress is almost impossible over the steep rock slides.

Continue ascend.

55.00 High inaccessible table mountain situated about 10.00 chs. south.

Descend. Steep rock slide facing SE.

65.00 Ascend.

77.00 Ridge bears NNW. and SSE. from table mountain. Descend.

78.49 Set a malpais stone 8x14x28 ins., 21 ins. in the ground for the cor. of secs. 5, 6, 31 and 32, marked with 1 notch on the W. and 5 notches on the E. edges, and raise a mound of stones 3 ft. base, $1\frac{1}{2}$ ft. high, W. of cor. Pits impracticable.

Land, extremely mountainous, and covered with loose rock, and boulders.

Soil, 4th rate, stony.

Scattering greasewood and cactus brush.

No grass.

Mountainous land, covered with loose rock and boulders, and exceptionally difficult to survey, 78.49 chs. At noon,

at above cor. I set off $22^{\circ}53'S$. on the decl. arc, and observe the sun on the meridian. The resulting latitude reading is $35^{\circ}04\frac{1}{2}N$.

Thence I run, East, on a true line, between secs. 5 and 32. Over a very steep rock slide facing the SE.

7.10 Rocky gorge, course S. Ascend difficult rock slide.

16.30 Sharp ridge, bears N. and S. Line to the east, then enters unsurveyable land, covered with bluffs and rock slides. I discontinue the line at this point.

January 3, 1912.

GENERAL DESCRIPTION.

This township is very rough and mountainous in the west two thirds, and is unsurveyable in the north parts of secs. 4 and 5. Soil is nearly all 3rd or 4th rate, stony, and there is very little grass. The undergrowth consists of greasewood and cactus, which in the easterly portions become very dense. There are several small springs of fairly good water, their location being noted under subdivisional lines. Wild burros seem to have taken this range to the exclusion or detriment of the cattle business, which evidently would not be very profitable judging from the general scarcity of feed.

January 25, 1912.

20. Boundaries of Township 19 North, Range 19 West.

Chains.						
Latitudes, departures, and closing errors.						
Line designated.	True bearing.	Dist.	Latitudes.		Departures.	
			N.	S.	E.	W.
N. bdy. sec. 6	East,	78.49			78.49	
Bet. secs. 5 & 6.	S. 0° 05' W.	81.15		81.15		0.12
Bet. secs. 5 & 8.	East,	80.00			80.00	
Bet. secs. 4 & 9.	East,	80.00			80.00	
Bet. secs. 3 & 4	N. 0° 04' W.	81.35	81.35			0.09
N. bdy. secs. 3, 2, 1.	East,	240.00			240.00	
5th Guide Mer. W.						
Bet. secs. 1 & 6.	S. 0° 09' E.	81.12		81.12		0.21
Bet. secs. 7 & 12	S. 0° 13' E.	80.00		80.00		0.30
Bet. secs. 12 & 18	S. 0° 09' E.	80.00		80.00		0.31
Bet. secs. 18 & 24	S. 0° 08' E.	80.00		80.00		0.34
Bet. secs. 25 & 30	S. 0° 06' E.	80.22		80.22		0.14
Bet. secs. 31 & 36	S. 0° 03' E.	80.10		80.10		0.07
South Bdy.	West,	479.00				479.00
West Bdy.	North,	481.12	481.12			
Convergency					0.51	
Totals,			562.47	562.57	480.07	479.21
				562.47	479.21	
Error in latitude,				0.10		
Error in departure,					0.86	

William D. Alexander
 U.S. Deputy Surveyor.

FINAL OATHS OF DEPUTY SURVEYOR AND HIS ASSISTANTS.

LIST OF NAMES.

A list of the names of the individuals employed by William P. Alexander

William P. Alexander, 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 Exterior lines

of T 17 N R 19 W and T 18 N R 19 W and T 19 N R 19 W showing the respective capacities in which they acted:

- David J. Moss Robt. S. Smoot, Chainman.
- Louis Van Marter B.P. Wulfersten, Chainman.
- E. Westover, Moundman.
- Laurence Sklar, Moundman.
- Chas. Clayton, Axman.
- Jack Ray, Axman.
- W. J. Nations, Flagman.

FINAL OATH OF ASSISTANTS.

We hereby certify that we assisted William P. Alexander

William P. Alexander, United States Deputy Surveyor, in surveying all those parts or portions of the North and West Boundary of T 17 N R 19 W; West and W 3 1/2 miles of North Boundary T 18 N R 19 W; West and W 1 mile of North Boundary T 19 N R 19 W and W boundary in part of T 20 N R 19 W of the Sierra San River Point meridian, Territory of Arizona, which 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 Arizona
- Robt. S. Smoot David J. Moss, Chainman.
 - B.P. Wulfersten Louis Van Marter, Chainman.
 - E. Westover, Moundman.
 - Chas Clayton, Moundman.
 - Jack Ray, Axman.
 - W J Nations, Flagman.

Subscribed and sworn to before me this 8th day of January, 1912

William P. Alexander
U. S. Deputy Surveyor

FINAL OATH OF UNITED STATES DEPUTY SURVEYOR.

I, William B. Alexander, United States Deputy Surveyor, do solemnly swear that, in pursuance of a contract received from Frank J. Ingalls United States Surveyor General for Arizona, bearing date of the 26 day of May, 1909, 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 Arizona, the Manual of Surveying Instructions, and the laws of the United States, surveyed all those parts or portions of West and North boundary of T 17 N R 19 W; West and W 3 1/2 miles of North boundary T 18 N R 19 W; and West and W 1 mile of the North boundary of T 19 N R 19 W of the Gila Salt River Base & meridian, in the Territory of Arizona which 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 survey have been established and perpetuated in strict accordance with the Manual of Surveying Instructions, and the special written instructions of the United States Surveyor General for Arizona and in the specific manner described in the field notes, and that the foregoing are the original field notes of such survey.

William B. Alexander
United States Deputy Surveyor.

Subscribed by said William B. Alexander and sworn to before me) this 6th day of February, 1912

W. C. [Signature]
[Signature]



APPROVAL.

OFFICE OF THE UNITED STATES SURVEYOR GENERAL,

Phoenix Arizona, Feb. 26, 1913.

The foregoing field notes of the survey of the West and portion of North bdy of Tp. 17 North, R. 19 West, the West and portion of North bdy of Tp. 18 North, R. 19 West, and the West and portion of North bdy of Tp. 19 North, R. 19 West, Gila & Salt River Base & Meridian, Arizona executed by William B. Alexander, U.S. Deputy Surveyor under his contract No. 156, dated May 26, 1909, having been critically examined, and the necessary corrections and explanations made, the said field notes, and the surveys they describe, are hereby approved.

Frank J. Ingalls
United States Surveyor General.

I certify that the foregoing transcript of the field notes of the above-described surveys in _____, has been correctly copied from the original notes on file in this office.

United States Surveyor General.