3557

FIELD NOTES

OF THE SURVEY OF

Part of North Boundary,

West Boundary and

Part of the Subdivision Lines of

TOWNSHIP 28 NORTH, RANGE 13 WEST,

(In the Hualpai Indian Reservation)

Of the Gila and Salt River Base and *Meridian,*

In the State of Arizona.

EXECUTED BY

Dupree R. Averill, U. S. Surveyor

and

Glenn F. Sawyer, U. S. Transitman,

In the capacity of U. S. Surveyor s, *under instructions dated* February 26 , 1920 ,

issued by the United States Surveyor General to govern surveys included in

Group No. 109, Ariz, *which were approved by the Commissioner of the General Land*

Office, March 10, , 1920, *and* Assignment Instructions dated

April 9, 1921.

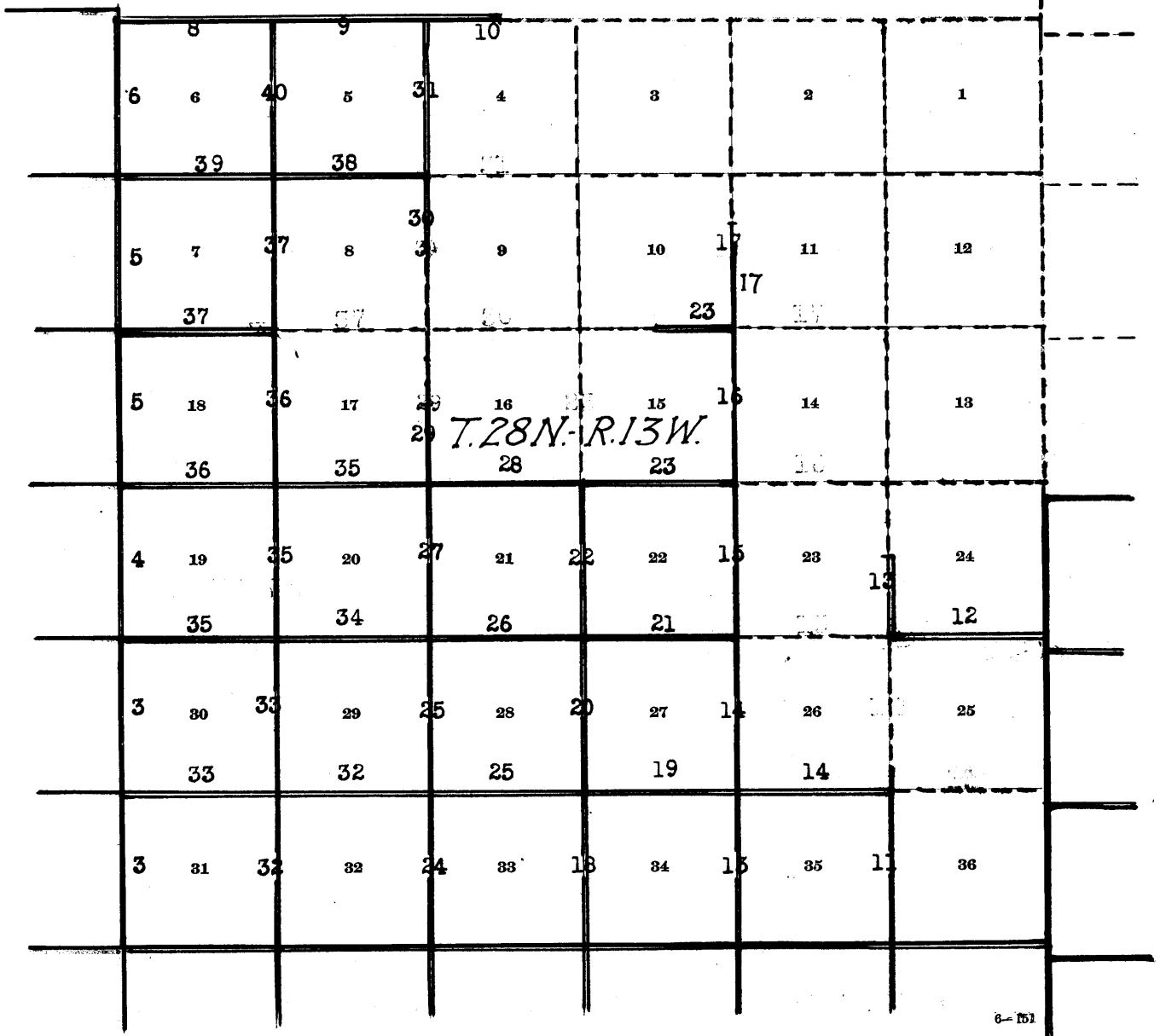Survey commenced May 17 , 1921.

Survey completed June 19 , 1921.

Book "I"

Group 109 - - - - - Arizona.

BOOK 3557

INDEX DIAGRAM.

Township 28 N. Range 13 W.

T.28N.-R.13W.

Lines surveyed under this group.

Lines surveyed under Group 110.

Unsurveyed.

DATE DIAGRAM

BOOK "I"

Group 109 - Arizona.

Township 28 North, Range 13 West

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

Left side (top to bottom): 6-1-21, 5-31-21, 5-29-21, 5-29-21, 5-28-21, 5-20-21

Vertical interior labels: 6-2-21, 5-30-21, 5-30-21, 5-29-21, 6-19-21, 5-18-21

Column 3 vertical: 6-2-21, 5-31-21, 5-30-21, 6-12-21, 6-8-21, 6-8 1921 5-18

Right interior vertical: 6-13-21, 6-13-21, 5-19-21, 6-13-21, 6-13-21, 6-11-21

Column 4-5 interior: 6-8-21, 6-14-21, 6-10-21

For dates of survey of this line, see Book "H" of this group.

For dates of survey of this line, see Book "I" of this group.

—————— Red lines indicate surveys by Dupree R. Averill, U. S. S., on dates shown thereon.

—————— Blue lines indicate surveys by Glenn F. Sawyer, U. S. T., on dates shown thereon.

Surveys hereinafter described executed by Dupree R. Aver-
ill, U. S. Surveyor, and Glenn F. Sawyer, U. S. Transit-
man, on dates shown on diagram on page 1 hereof, using
respectively Buff solar transit No. 9223 and Young and
Sons' light mountain transit No. 8389. For description
of instruments and certificates of approval, see Book "B"

Unless otherwise specified, all measurements are made with
a Lufkin steel tape, 5 chs. in length, compared with a
Chesterman standard steel tape and found correct. The
measurements are made on the slope, the vertical angles
determined and the slope measurements properly reduced
to true horizontal distances.

We examine the adjustments of the transits and correct all
errors; then, to test the solar apparatus, by comparing
their indications, resulting from solar observations
made during a. m. and p. m. hours, with a meridian de-
termined by observations on Polaris at elongation, we
proceed as follows:

May 17, 1921: at our camp, near the NE. cor. of sec. 30,
T. 27 N., R. 13 W., G. and S. R. B. and M., lat.35°42½'
N., long. 113° 42½' W., using the meridian determined
as described in Book "H", at 9 hrs. 0 m., a. m., l. m. t.,
set off 35° 42½' N. on the lat. arcs; 19° 19' N. on
the decl. arcs; and determine a meridian with each
solar which agrees with the true meridian.

At apparent noon, with the lat. arc unchanged, we observe
the sun on the meridian with each solar; the resulting
decl. in each case is 19° 20½' N., which is the comput-
ed decl. of the sun.

At 3 hrs. 0 m., p. m., l. m. t., with the lat. arcs un-
changed we set off 19° 22½' N. on the decl. arcs, and
determine a meridian with each solar, which agrees with
the true meridian.

As all of the solar observations during the usual hours
of solar work come within 1' 30" of the true meridian,
we conclude that the adjustments of the solar are sat-
isfactory.

Test of Stadia Interval, Buff Transit 9223.

May 17, 1921. I make the following test of the stadia
wire interval:
    Horizontal distance - length of base   10.00 chs.
    Mean of ten rod readings   5.000 ft.
    Vertical angle of test   0°
                    K   =   2. chs.

DEPARTMENT OF THE INTERIOR

GENERAL LAND OFFICE

OFFICE OF ASSISTANT SUPERVISOR OF SURVEYS

250 Federal Building,
Phoenix, Arizona,
February 9, 1923.

Mr. Frank P. Trott,
U. S. Surveyor General,
Phoenix, Arizona.

Dear Sir:

The range line between Groups 109 and 110
was included in the Special Instructions for Group
110, but the field work under Group 109 progressed
so much faster than anticipated that it became
necessary to assign Surveyor Averill under Group 109
to the completion of the range line rather than
suffer a considerable delay and expense which the
waiting for Engineer Kimmel under Group 110 to com-
plete the line would entail.   Accordingly, Surveyor
Averill reached the termination of the range line
at 480 chs., -before the 7th Standard Parallel had
been established-, and therefore was compelled to
establish his fractional north bdy. of T. 28 N.,
R. 13 W. as corners of four sections.

Very respectfully,

Assistant Supervisor of Surveys.

Survey of the West Boundary
of T. 28 N., R. 13 W.

| Chains	
	From the cor. of Ts. 27 and 28 N., Rs. 13 and 14 W.,which is an iron post, 3 ins. diam., set in a mound of stone, properly marked, as described in the field notes of current Group No. 110,
	North, bet. secs. 31 and 36.
	Over rough mountainous land, through scattering timber and dense undergrowth. Desc. 445 ft., over N. slope.
27.54	Center of wash, 1 ch. wide, 1 ft. deep, course NE.
31.27	Main wash of Meriwhitica Canyon, 40 lks. wide, 2 ft.deep, course N. 75° E. Thence across bottom land.
40.00	Set an iron post, 3 ft. long, 1 in. diam., 16 ins. in the ground, with marked (X) stone, for $\frac{1}{4}$ sec. cor.; and raise a mound of stone around post,with brass cap marked

$$\text{S 36} \mid \overset{\frac{1}{4}}{\text{S 31}}$$
$$1921$$
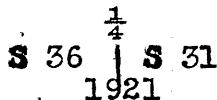
	Asc. 300 ft., over SE. slope.
67.54	Spur, slopes E. Desc. 180 ft.
80.00	Set an iron post, 3 ft. long, 2 ins. diam., 14 ins.in the ground, with marked (X) stone, for cor. of secs. 25, 30, 31 and 36; and raise a mound of stone around post, with brass cap marked

T 28 N

R 14 W | R 13 W
S 25 | S 30
S 36 | S 31
1921
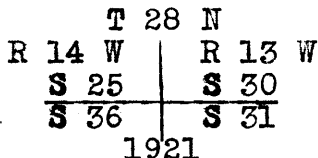
Land, rough mountainous.
Soil, sandy, gravelly and rocky, 3rd and 4th rates.
Timber, dogwood.
Undergrowth, sagebrush and cactus.
Fair grass in bottom of canyon.

	North, bet. secs. 25 and 30. Over rough mountainous land, through scattering timber and dense undergrowth.
	Desc. 150 ft.
15.00	Wash, 70 lks. wide, 2 ft. deep, NE. Impossible to chain from this point, out of Meriwhitica Canyon. Proceed to a point on the N. rim of Meriwhitica Canyon, from which flag at 74.04 chs. North of the cor. of Ts. 27 and 28 N., Rs. 13 and 14 W. brs. S. 1° 28' W. Measure a base N. 80° 31' E. 15.80 chs. - impracticable to secure longer base - from the E. end of which, flag at the 74.04 ch. point brs. S. 16° 41' W.

N.80°31'E.
15.80 chs.
S.1°28'W.
S.16°41'W.
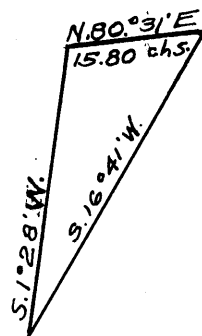
The three angles of the triangle are 15° 13', 100° 57' and 63° 50', the sum of which is 180°. The distance triangulated is given by the sine proportion:

$$\frac{X}{15.80} = \frac{\sin. 63° 50'}{\sin. 15° 13'}$$

log.	15.80	= 1.198657
log. sin.	63° 50'	= 9.953042
		1.151699
log. sin.	15° 13'	= 9.419079
log. X		= 1.732620
	X	= 54.03 chs.

Survey of Part of the West Boundary
T. 28 N., R. 13 W.

Chains	
	The latitude and departure of this line are therefore North 54.01 chs. and East 1.38 chs.
	Thence West 1.38 chs. to true line bet. secs. 25 and 30.
	Thence South 0.05 chs. to
48.00	Set an iron post, 3 ft. long, 1 in. diam. on bed rock, with cross (X) at exact cor. point, for witness cor. to $\frac{1}{4}$ sec. cor.; and raise a mound of stone around post, with brass cap marked

$$\text{S 25} \cdot \overset{\frac{1}{4}}{\underset{\text{W | C}}{|}} \text{S 30}$$
1921

	The true point for $\frac{1}{4}$ sec. cor. falls on wall of canyon where it cannot be established. Desc. 90 ft.
52.60	Head of draw, course SW. Asc. 130 ft.
62.50	Spur, slopes NE. Desc. 65 ft.
77.00	Draw, course E. Asc. 40 ft.
80.00	Set an iron post, 3 ft. long, 2 ins. diam., 6 ins. in the ground, with marked (X) stone, for cor. of secs. 19, 24, 25 and 30; and raise a mound of stone around post, with brass cap marked

$$
\begin{array}{c|c}
\multicolumn{2}{c}{\text{T 28 N}} \\
\text{R 14 W} & \text{R 13 W} \\
\text{S 24} & \text{S 19} \\
\hline
\text{S 25} & \text{S 30} \\
\multicolumn{2}{c}{\text{1921}}
\end{array}
$$

Land, S. $\frac{1}{2}$, rough mountainous; N. $\frac{1}{2}$, rolling.
Soil, sandy, gravelly and rocky, 4th rate.
Timber, dogwood.
Undergrowth, sagebrush and cactus.
Fair grass.

	North, bet. secs. 19 and 24.
	Over heavily rolling land, through scattering timber and dense undergrowth. Desc. 30 ft.
3.85	Draw, course NE. Asc. 35 ft.
19.16	Spur, slopes E. Desc. 60 ft.
23.44	Draw, course SE. Asc. 235 ft.
40.00	Set an iron post, 3 ft. long, 1 in. diam., 12 ins. in the ground, with marked (X) stone, for $\frac{1}{4}$ sec. cor.; and raise a mound of stone around post, with brass cap marked

$$\text{S 24} \overset{\frac{1}{4}}{|} \text{S 19}$$
1921

	Continue ascent, 40 ft.
48.54	Spur, slopes NE. Desc. 340 ft.
80.00	Draw, course NE. Set an iron post, 3 ft. long, 2 ins. diam., 18 ins. in the ground, with marked (X) stone, for cor. of secs. 13, 18, 19 and 24; and raise a mound of stone around post, with brass cap marked

$$
\begin{array}{c|c}
\multicolumn{2}{c}{\text{T 28 N}} \\
\text{R 14 W} & \text{R 13 W} \\
\text{S 13} & \text{S 18} \\
\hline
\text{S 24} & \text{S 19} \\
\multicolumn{2}{c}{\text{1921}}
\end{array}
$$

Land, heavily rolling.
Soil, sandy and gravelly loam, 3rd and 4th rates.
Timber, cedar, and dogwood.

Survey of Part of the West Boundary
of T. 28 N., R. 13 W.

Chains	
	Undergrowth, sagebrush and cactus.
	Good grass.

North, bet. secs. 13 and 18.
Over heavily rolling land, through scattering timber and
    dense undergrowth. Asc. 145 ft.

6.34	Spur, slopes E. Desc. 130 ft.
18.84	Draw, course SE. Asc. 260 ft.
31.54	Ridge, brs. E. and W. Desc. 45 ft.
40.00	Set an iron post, 3 ft. long, 1 in. diam., 6 ins. in the ground, with marked (X) stone, for ¼ sec. cor.; and raise a mound of stone around post, with brass cap marked

$$\text{S 13} \mid \overset{\frac{1}{4}}{} \mid \text{S 18}$$
$$1921$$

	Desc. 155 ft.
51.34	Draw, course NE. Asc. 110 ft.
61.24	Ridge, brs. E. and W. Desc. 220 ft.
80.00	Set an iron post, 3 ft. long, 2 ins. diam., on bed rock, with marked (X) stone, for cor. of secs. 7, 12, 13 and 18; and raise a mound of stone around post, with brass cap marked

$$\text{T 28 N}$$
$$\text{R 14 W} \mid \text{R 13 W}$$
$$\text{S 12} \mid \text{S 7}$$
$$\text{S 13} \mid \text{S 18}$$
$$1921$$

Land, heavily rolling.
Soil, sandy loam, 3rd rate.
Timber, scattering dogwood.
Undergrowth, sagebrush and cactus.
Fair grass.

North, bet. secs. 7 and 12.
Over rolling and broken land, through scattering under-
    growth. Desc. 235 ft.

6.50	Draw, course NE. Asc. 280 ft.
18.54	Offset East 2.00 chs. and continue North on offset line, through sec. 7.
	Continue ascent, 220. ft.
37.81	Thence West 2.00 chs. to true line.
	Spur, slopes NE. Desc. 60 ft.
40.00	Set an iron post, 3 ft. long, 1 in. diam., on bed rock, with cross (X) at exact cor. point, for ¼ sec. cor.; and raise a mound of stone around post, with brass cap marked

$$\text{S 12} \mid \overset{\frac{1}{4}}{} \mid \text{S 7}$$
$$1921$$

Continue descent, 100 ft.

|	
55.00	Draw, course NE. Asc. 165 ft.
72.00	Spur, slopes NE. Desc. 100 ft.
80.00	Set an iron post, 3 ft. long, 2 ins. diam., on bed rock, with cross (X) at exact cor. point, for cor. of secs. 1, 6, 7 and 12; and raise a mound of stone around post, with brass cap marked

Survey of Part of the West Boundary
of T. 28 N., R. 13 W.

Chains	
	T 28 N
	R 14 W | R 13 W
	S 1 | S 6
	S 12 | S 7
	1921

Land, rolling and broken.
Soil, rocky, 4th rate; limestone formation.
Timber, none.
Undergrowth, palo verde, mescal, dogwood, sagebrush and
    cactus.

North, bet. secs. 1 and 6.
Over rolling and broken land, through scattering under-
    growth.

10.17 Rim of canyon, walls 600 ft. high, brs. E. and W. Im-
    possible to chain from this point. Set a flag ahead
    on line, from which I measure a base N. 80° 51' E.,
    24.98 chs., from the E. end of which, flag at the 10.17
    ch. point brs. S. 27° 59' W.
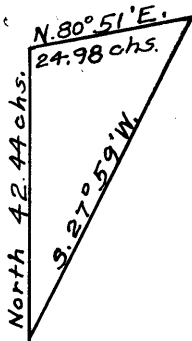
The three angles of the triangle
are therefore, 99° 9', 52° 52' and
27° 59', the sum of which is 180°.
The distance triangulated is given
by the sine proportion:

$$\frac{X}{24.98} = \frac{\sin. 52° 52'}{\sin. 27° 59'}$$

log. 24.98	= 1.397592
log. sin. 52° 52'	= 9.901585
	1.299177
log. sin. 27° 59'	= 9.671372
log. X	= 1.627805
X	= 42.44 chs.,

which added to 10.17 chs., gives

52.61 Thence South 12.61 chs.

40.00 Set an iron post, 3 ft. long, 1 in. diam., on bed rock,
    with marked (X) stone, for ¼ sec. cor.; and raise a
    mound of stone around post, with brass cap marked

S 1 \| S 6
1921

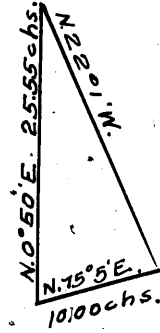The 52.61 ch. point is 1800 ft. below the rim of canyon
    at 10.17 chs.

52.61 Impracticable to chain from this point.
Set an iron post 3 ft. long, 3 ins. diam., 20 ins. in
    the ground, with marked (X) stone, for witness cor.
    to cor. of T. 28 N., R. 13 W., and to closing cor. of
    T. 28 N., R. 14 W., marked on brass cap

T 28 N
R 14 W W C
S 1
C C
1921

T 28 N
R 13 W
S 6

A small barrel cactus on an inaccessible ledge of
    rock brs. N. 0° 50' E.

Survey of Part of the West Boundary
of T. 28 N., R. 13 W.

Chains	
	From the 52.61 ch. point, measure a base N. 75° 5' E. 10.00 chs., from the E. end of which, cactus brs. N. 22° 01' W. The three angles of the triangle are therefore 74° 15', 22° 51' and 82° 54', the sum of which is 180°. The distance triangulated is given by the sine proportion

$$\frac{X}{10.00} = \frac{\sin. 82° 54'}{\sin. 22° 51'}$$

$$
\begin{aligned}
\log. \ 10.00 &= 1. \\
\log. \sin. 82° 54' &= 9.996657 \\
&\overline{0.996657} \\
\log. \sin. 22° 51' &= 9.589190 \\
\log. \ X &= \overline{1.407467} \\
X &= 25.55 \ chs.
\end{aligned}
$$

The latitude and departure of this line are therefore 25.55 chs. North and 0.37 chs. East, which added to 52.61 chs., gives 78.16 chs. North and 0.37 chs. East.

78.16 A witness cor. cannot be located at this point, nor is it possible to get any nearer to the true point for cor. of T. 28 N., R. 13 W.

80.00 True point for cor. to Ts. 28 and 29 N., R. 13 W., inaccessible.
Land, rolling, broken, and mountainous.
Soil, rocky, 4th rate, limestone formation.
No timber.
Undergrowth, palo verde, mescal, sagebrush and cactus.

Survey of Part of the North Boundary
of T. 28 N., R. 13 W.

Chains	
	As the North Bdy. of T. 28 N., R. 13 W., cannot be survey-ed on the true line in the usual manner, because of the impassable nature of the country, I determine the position for cors. by the methods of triangulation, offset and traverse

Beginning at a point near the N. bdy. of Sec. 6, T. 28 N.,
R. 13 W., from which the barrel cactus 78.16 chs. North
and 0.37 chs. East of the cor. of secs. 1, 6, 7 and
12, on the West bdy. of T. 28 N., R. 13 W., brs. N.
89° 19' W., I measure a base S. 4° 32' E., 16.23 chs.,
from the S. end of which, barrel cactus brs. N. 66°
18' W. The three angles of the triangle are there-
fore 23° 1', 95° 13' and
61° 46'; the sum of which is
180°. The distance triangu-
lated is given by the sine
proportion:
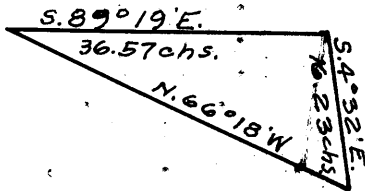
$$\frac{X}{16.23} = \frac{\sin. 61° 46'}{\sin. 23° 1'}$$

$$
\begin{aligned}
\log. 16.23 &= 1.210319 \\
\log. \sin. 23° 1' &= 9.592176 \\
&\quad\overline{1.618143} \\
\log. \sin. 61° 46' &= 9.944990 \\
\log. X &= \overline{1.563133} \\
X &= 36.57 \text{ chs.}
\end{aligned}
$$

From the end of this course, I traverse as follows:

N. 67° E.,	1.10 chs.
N. 73° 24' E.,	2.00 "
N. 58° W.,	2.28 "
West	.12 "
North	.07 " To

a point 80.00 chs. North and 37.82 chs. East of the cor.
of secs. 1, 6, 7, and 12, the point for ¼ sec. cor.
of secs. 6 and 31, as determined from the controlling
length on the S. bdy. of Tp.

37.82 Set an iron post, 3 ft. long, 1 in. diam., on surface
rock, with cross (X) at exact cor. point, for ¼ sec.
cor.; and raise a mound of stone around post, with
brass cap marked

$$\frac{1}{4} \quad \frac{\text{S } 31}{\text{S } 6}$$
1921

Thence run traverse as follows:

South	0.07 chs.
East	0.12 "
S. 58° E.	2.28 "
S. 82° E.	34.14 "
East	4.16 "
North	0.99 " To a

point 40.02 chs. East and 5.04 chs. South of the ¼
sec. cor. of secs. 6 and 31, from which the true point
for cor. of secs. 5, 6, 31 and 32 brs. N. 0° 15' W.,
5.04 chs. dist. At this point,
Set an iron post, 3 ft. long, 2 ins. diam., on bed rock,
with cross (X) at exact cor. point, for witness cor.
to cor. of secs. 5, 6, 31 and 32; and raise a mound
of stone around post, with brass cap marked

W C
T 29 N | R 13 W
S 31 | S 32
S 6 | S 5
T 28 N
1921

Chains	
	Land, rough mountainous.

Soil, rocky, 4th rate.
No timber.
Undergrowth, sagebrush and cactus.

From the witness cor. 5.04 chs. S. 0° 15' E. of the true
point for cor. of secs. 5, 6, 31 and 32, run traverse
along N. bdy. of sec. 5 as follows: .

South		0.99 chs.
S. 75° E.,		9.09 "
N. 47½° E.,		.30 "

From the end of the last course, set a flag ahead on a
bearing N. 76° 25' E., from which I measure a base S.
22° 9' W., 10.06 chs., from S. end of which flag at
beginning of triangulation brs. N. 89° 51' W. The
three angles of the triangle are therefore 13° 44',
54° 16' and 112° 00', the sum of which is 180°.

The distance triangulated is given
by the sine proportion:

$$\frac{X}{10.06} = \frac{\sin. 112°}{\sin. 13° 44'}$$

log. 10.06	= 1.002598
log. sin. 13° 44'	= 9.375487
	1.627111
log. sin. 112°	= 9.967166
log. X	= 1.594277
X	= 39.29 chs. which gives one leg
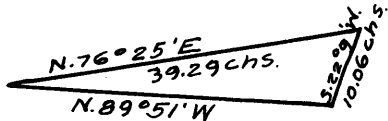
of the traverse
N. 76° 25' E. 39.29 chs. From this point,
spring brs. S. 45° E., 7.00 chs. dist.

Thence	South	1.05 chs.	
	West	7.21 "	To a point

40.00 chs. East of the true point for Cor. of secs.
5, 6, 31 and 32, where I
Set an iron post, 3 ft. long, 1 in. diam., on bed rock,
with marked (X) stone, for ¼ sec. cor.; and raise a
mound of stone around post, with brass cap marked

$$\frac{1}{4} \quad \frac{\text{S 32}}{\text{S 5}}$$

1921

From this ¼ sec. cor.
East on a true line, bet. secs. 5 and 32, continuing
measurement.
Over mountainous land, through scattering undergrowth.
Desc.

55.70	Asc. 135 ft.
64.55	Spur, slopes NE. Desc. 45 ft.
76.05	Draw, course NE. Spring in draw, 2 chs. SW. Asc. 70 ft.
80.00	Set an iron post, 3 ft. long, 2 ins. diam., 18 ins. in

the ground, with marked (X) stone, for cor. of secs.
4, 5, 32 and 33; and raise a mound of stone around
post, with brass cap marked

T 29 N | R 13 W
S 32 | S 33
S 5 | S 4
T 28 N
1921
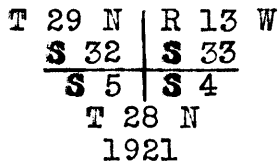
Land, mountainous.
Soil, rocky, 4th rate.

Survey of Part of the North Boundary
of T. 28 N., R. 13 W.

| Chains	
	Timber, none.
	Undergrowth, sagebrush and cactus.
	East, on a true line, bet. secs. 4 and 33.
	Over mountainous land, through scattering undergrowth.
16.87	Stadia from this point: 5.784 and 5.806 ft., 0°.
28.47	From this point, traverse as follows:

$$\text{N. } 12\tfrac{3}{4}° \text{ E.} \qquad\qquad 1.10 \text{ chs.}$$
$$\text{N. } 77\tfrac{1}{2}° \text{ E.} \qquad\qquad 4.70 \text{ chs.}$$

Stadia on course S. 79° E.: 3.584 and 3.606 ft.; 0°.

      Thence S. 87° W. 0.37 chs. To a point 0.70
      chs. North of the true point for $\frac{1}{4}$ sec. cor. of

      secs. 4 and 33, where I

Set an iron post, 3 ft. long, 1 in. diam., on bed rock
  with cross (X) at exact cor. point, for witness cor.
  to $\frac{1}{4}$ sec. cor.; and raise a mound of stone around
  post, with brass cap marked

$$\frac{1}{4} \quad \begin{array}{c} \text{W C} \\ \hline \text{S 33} \\ \hline \text{S 4} \\ 1921 \end{array}$$

Impracticable to continue boundary survey from this point.
Land, mountainous.
Soil, rocky, 4th rate.
Timber, none.
Undergrowth, sagebrush and cactus.

Survey of Part of the Subdivision
of T. 28 N., R. 13 W.

Chains	
	From the cor. of secs. 1, 2, 35 and 36, on the S. bdy. of Tp., described in Book "H", it is impossible to chain bet. secs. 35 and 36, as the line ascends over impassable cliffs. From a point on top of these cliffs, a flag at the cor. of secs. 1, 2, 35 and 36 brs. S. 0° 40' W. From this point, I measure a base S. 89° 20' E. 10.00 chs., from the E. end of which, flag brs. S. 15° ½' W. The three angles of the triangle are therefore 14° 20½', 90° and 75° 39½', the sum of which is 180°. The distance triangulated is given by tan. 75° 39½' X 10.00 = 3.91127 X 10.00 = 39.11 chs. to top of rim, bearing N. 10° W. and S. 10° E., 2000 ft. above the cor. of secs. 1, 2, 35 and 36

S. 89° 20' E.
10.00 chs.

S. 0° 40' W.

39.11 chs.

S. 15° 0 ½' W.

Cor. secs. 1, 2, 35 and 36.
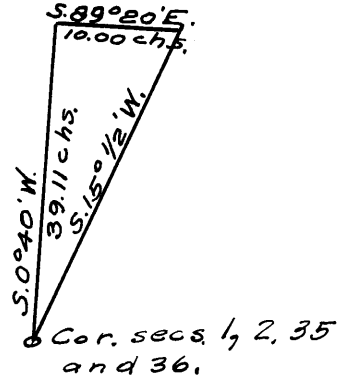
	Thence North 0.89 chs. and West 0.07 chs. to a point 0.40 chs. East of the true point for ¼ sec. cor., where I
40.00	Set an iron post, 3 ft. long, 1 in. diam., 10 ins. in the ground, with marked (X) stone, for witness cor. to ¼ sec. cor.; and raise a mound of stone around post, with brass cap marked

W C   S 35 | S 36
¼
1921

	Thence N. 0° 1' W. on offset line through sec. 36, .40 chs. East of line.
51.00	West 0.40 chs. to true line; thence N. 0° 1' W. bet. secs. 35 and 36.
	Over rolling land, through scattering undergrowth.
52.40	Head of draw, course E. Asc. 55 ft.
76.12	Rim of canyon, brs. E. and W. Set an iron post, 3 ft. long, 2 ins. diam., 14 ins. in the ground, with marked (X) stone, for witness cor. to cor. of secs. 25, 26, 35 and 36; and raise a mound of stone around post, with brass cap marked

W C
T 28 N   R 13 W
S 26 | S 25
S 35 | S 36
1921

80.00	The true point for cor. of secs. 25, 26, 35 and 36 falls on perpendicular wall, where it cannot be established.
	Land, rolling and mountainous.
	Soil, sandy and rocky, 4th rate.
	No timber.
	Undergrowth, cat claw, sagebrush, cactus, greasewood and dogwood.
	Sparse grass.

As the ¼ sec. cor. bet. secs. 25 and 36 cannot be set, nor a witness cor. to said cor. within the allowable limit, I abandon the survey of the mile bet. secs. 25 and 36.

The ¼ sec. cor. bet. secs. 25 and 26 cannot be set, nor a witness cor. to said cor. within the prescribed limits. I therefore determine the position for cor. of secs. 23, 24, 25 and 26 by triangulation from the witness cor. to cor. of secs. 25, 26, 35 and 36.

Survey of Part of the Subdivision
of T. 28 N., R. 13 W.

Chains	
	From the witness cor. to cor. of secs. 25, 26, 35 and 36 set a flag ahead on a bearing N. 6° 38' E. From this flag, measure a base S. 77° 59' W.; 18.835 chs., from the W. end of which, flag at witness cor. brs. S. 5° 23' E. The three angles of the triangle are there- fore 12° 1', 96° 38' and 71° 21', the sum of which is 180°. The distance triangulated on the bearing N. 5° 23' W., is found from the sine proportion:

$$\frac{X}{18.835} = \frac{\sin. 71° 21'}{\sin. 12° 1'}$$
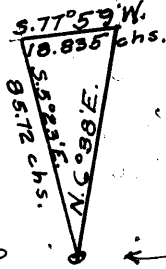
log. 18.835 = 1.274965
log. sin. 71° 21' = 9.976574
                    1.251539
log. sin. 12° 1' = 9.318473
          log. X = 1.933066
               X = 85.72 chs.

Witness cor. to cor. secs. 25, 26, 35 and 36.

Thence South 1.46 chs. and East 8.02 chs., to the true point for cor. of secs. 23, 24, 25 and 26, where I

Set an iron post, 3 ft. long, 2 ins. diam., 10 ins. in the ground, with marked (X) stone, for cor. of secs. 23, 24, 25 and 26; and raise a mound of stone around post, with brass cap marked

T 28 N R 13 W·

S 23	S 24
S 26	S 25

1921

Land, mountainous.
Soil, rocky, 4th rate.
No timber.
Undergrowth, sagebrush, greasewood, cat claw and cactus.
Fair grass.

	East, on a random line, bet. secs. 24 and 25.
40.00	Set temp. ¼ sec. cor.
79.74	Fall 35 lks. S. of the cor. of secs. 24 and 25, on the E. bdy. of Tp., described in Book "G".
	Thence
	S. 89° 45' W., on a true line, bet. secs. 24 and 25.
	Over rolling and broken land, through dense undergrowth
	Desc. 120 ft.
29.20	Draw, course SW. Asc. 150 ft.
39.20	Spur, slopes SW. Desc. 15 ft.
39.87	Set an iron post, 3 ft. long, 1 in. diam., on bed rock, with marked (X) stone, for ¼ sec. cor.; and raise a mound of stone around post, with brass cap marked

	S 24
¼	S 25

1921

|	
	Continue descent, 100 ft.
44.50	Draw, course SW. Asc. 100 ft.
50.00	Top of mesa, brs. N. and S. Thence over rolling land.
79.74	The cor. of secs. 23, 24, 25 and 26.
	Land, rolling and broken.
	Soil, sandy and gravelly loam, 3rd and 4th rates.
	Timber, none.
	Undergrowth, sagebrush, greasewood, cat claw and cactus.
	Good grass.

Survey of Part of the Subdivision
of T. 28 N., R. 13 W.

Chains	
	N. 0° 1' W., bet. secs. 23 and 24.
	Over rolling and broken land, through dense undergrowth. Asc. 15 ft.
3.00	Spur, slopes W. Desc. 65 ft.
15.00	Draw, course SW. Asc. 95 ft.
40.00	Set an iron post, 3 ft. long, 1 in. diam., 20 ins. in the ground, with marked (X) stone, for ¼ sec. cor.; and raise a mound of stone around post, with brass cap marked

$$S\ 23 \quad | \overset{\frac{1}{4}}{} \quad S\ 24$$
$$1921$$

As the S. rim of the Grand Canyon comes at 69.76 chs., making it impossible to set a witness cor. to cor. of secs. 13, 14, 23 and 24 within prescribed limits, I discontinue the survey of this line at this cor.

Land, rolling and broken.
Soil, sandy and gravelly, 4th rate.
Timber, none.
Undergrowth, sagebrush, cat claw and cactus.
Fair grass.

In order to measure the line bet. secs. 34 and 35, which cannot be surveyed in the usual manner, I begin at the witness cor. to ¼ sec. cor. of secs. 2 and 3, T. 27 N., R. 13 W., which is 34.00 chs. S. 0° 14' E. of the cor. of secs. 2, 3, 34 and 35, on the S. bdy. of T. 28 N., R. 13 W.,
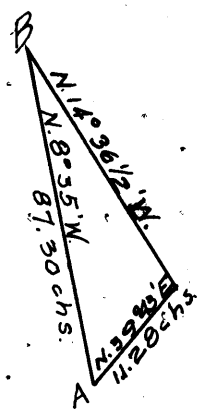
Thence North 20.49 chs.
East 12.43 " from the end of which course, "A", I set a flag "B" on a bearing N. 8° 35' W. near the point for cor. of secs. 26, 27, 34 and 35. From "A", measure a base N. 39° 43' E. 11.28 chs., from the end of which, flag "B" brs. N. 14° 36½' W. The three angles of the triangle are therefore 48° 18', 6° 1½' and 125° 40½'. The distance triangulated is given by the sine proportion:

$$\frac{X}{11.28} = \frac{\sin. 125°\ 40\frac{1}{2}'}{\sin. 6°\ 1\frac{1}{2}'}$$

log. 11.28	=	1.052309
log. sin. 6° 1½'	=	9.021034
		2.031275
log. sin. 125° 40½'	=	9.909736
log. X	=	1.941011
X	=	87.30 chs.

From flag "B" North 7.19 chs.
East .44 " to a point 80.00 chs.
N. 0° 1' W. of the true point for cor. of secs. 2, 3, 34 and 35, where I

Set an iron post, 3 ft. long, 2 ins. diam., 12 ins. in the ground, on bed rock, with cross (X) at exact cor. point, for cor. of secs. 26, 27, 34 and 35, and raise a mound of stone around post, with brass cap marked

$$T\ 28\ N \quad R\ 13\ W$$
$$S\ 27\ |\ S\ 26$$
$$S\ 34\ |\ S\ 35$$
$$1921$$
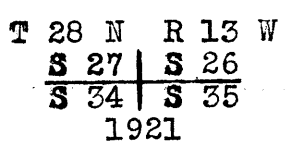
Survey of Part of the Subdivision
of T. 28 N., R. 13 W.

Chains	
	S. 0° 1' E., on a true line, bet. secs. 34 and 35.
	Over mountainous land, through scattering undergrowth.
	Asc. 355 ft.
25.70	Spur, slopes NE. Desc. 90 ft.
26.20	From this point, spring brs. S. 75½° E. 40 chs. dist.
40.00	Set an iron post, 3 ft. long, 1 in. diam., on bed rock, with cross (X) at exact cor. point, for ¼ sec. cor.; and raise a mound of stone around post, with brass cap marked

$$\text{S 34 } \frac{1}{4} \text{ S 35}$$
1921
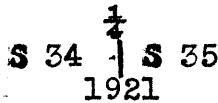
Land, rolling and broken.
Soil, rocky, 4th rate.
No timber.
Undergrowth, sagebrush, palo verde, cat claw, mescal and cactus.

	East, on a random line, bet. secs. 26 and 35.
19.35	Impossible to continue measurement on line from this point. Run traverse N. 48¼° W. 15.04 chs. From the end of this course, witness cor. 3.88 chs. S. 0° 1' E. of the true point for cor. of secs. 25, 26, 35 and 36, brs. S. 79° E. From end of traverse, measure a base N. 11°
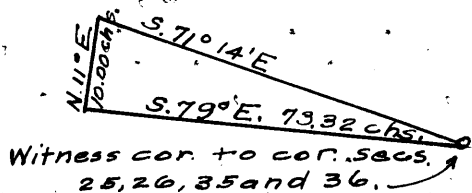
E., 10.00 chs., from N. end
of which, the witness cor.
brs. S. 71° 14' E. The three
angles of the triangle are
therefore 7° 46', 90° and
82° 14', the sum of which is
180°. The distance triangu-
lated on the bearing S. 79°
E. is given by tan. 82° 14'
X 10.00 = 7.33190 x 10.00 =
73.32 chs. From the lati-
tudes and departures of these courses, the falling
at the true point for cor. of secs. 25, 26, 35 and
36 is derived.

80.10	Intersect N. and S. line, 9 lks. N. of the true point for cor. of secs. 25, 26, 35 and 36, witnessed 3.88 chs. S. 0° 1' E. as hereinbefore described.
	Thence N. 89° 56' W., on a true line bet. secs. 26 and 35.
	Over mountainous land, through scattering undergrowth, distance by triangulation.
40.05	Set an iron post, 3 ft. long, 1 in. diam., on bed rock, with marked (X) stone, for ¼ sec. cor.; and raise a mound of stone around post, with brass cap marked

$$\frac{1}{4} \; \frac{\text{S 26}}{\text{S 35}}$$
1921
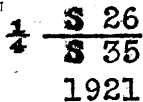
|	Desc., distance by chaining.
60.00	Wash in bottom of Spencer Canyon, course NW. Asc.
80.10	The cor. of secs. 26, 27, 34 and 35.
	Land, mountainous.
	Soil, rocky, 4th rate.
	No timber.
	Undergrowth, sagebrush, palo verde, cat claw, mescal and cactus.

N. 0° 1' W., bet. secs. 26 and 27.

Survey of Part of the Subdivision
of T. 28 N., R. 13 W.

Chains	
	Over mountainous land, through scattering undergrowth. Desc.
4.20	Draw, course NE. Asc.
12.20	Spur, slopes E. Desc. 175 ft.
16.80	Draw, course E. Asc. 45 ft.
22.80	Spur, slopes SE. Desc. 115 ft.
27.20	Cliffs, 80 ft. high, br. NW. and SE.
28.00	Enter wash in bottom of Spencer Canyon, course N. 10° W., from SE.
34.80	Leave wash. Asc. 40 ft.
37.10	Spur, slopes W. Desc.
39.80	Cliffs, 40 ft. high, br. N. 10° E., and S. 10° W.
40.00	Set an iron post, 3 ft. long, 1 in. diam., on bed rock, in a mound of stone, for ¼ sec. cor., marked on brass cap
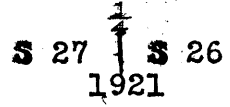
$$S\ 27 \mid \frac{1}{4} \mid S\ 26$$
$$1921$$

From which
       A cat claw, 12 ins. diam., brs. S. 27¼° E., 52
           lks. dist., marked ¼ S 26 B T.
       A cottonwood, 10 ins. diam., brs. N. 87½° W.,
           120 lks. dist., marked ¼ S 27 B T.

	Thence in wash in Spencer Canyon, North, from S. 10° W.
60.20	Leave wash, course N. 15° W., from South.
64.60	Spur, slopes W. Desc. 95 ft.
67.20	Wash, course N. 15° W., from S. 15° W. Asc. 180 ft.
71.70	Cliffs, 150 ft. high, br. NW. and SE.
72.10	Spur, slopes W. Desc. 90 ft.
74.70	Draw, course W. Asc. 115 ft.
76.80	Spur, slopes W. Desc.
80.00	Set an iron post, 3 ft. long, 2 ins. diam., 10 ins. in the ground, with marked (X) stone, for cor. of secs. 22, 23, 26 and 27; and raise a mound of stone around post with brass cap marked

$$T\ 28\ N \quad R\ 13\ W$$
$$S\ 22 \mid S\ 23$$
$$S\ 27 \mid S\ 26$$
$$1921$$
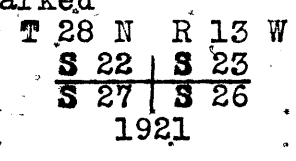
Land, mountainous.
Soil, rocky, 4th rate; limestone formation.
Timber, cottonwood.
Undergrowth, dogwood, sagebrush, ocotillo and cactus.

    As it is impossible to establish the ¼ sec. cor. bet. secs. 23 and 26 at the true point for cor., or a witness cor. within the prescribed limits, I leave the mile bet. secs. 23 and 26 unsurveyed.

	N. 0° 1' W., bet. secs. 22 and 23.
	Over broken and rolling land, through scattering undergrowth and timber. Desc. 135 ft.
7.00	Draw, course W. Asc. 130 ft.
11.80	Spur, slopes W. Desc. 45 ft.
13.60	Draw, course W. Asc. 155 ft.
23.20	Spur, slopes SW. Desc. 250 ft.
34.80	Stream of water, 15 lks. wide, course NE. Asc.
37.30	Spur, slopes NE. Desc.
39.30	Stream of water, 15 lks. wide, course NW. Asc.
40.00	Set an iron post, 3 ft. long, 1 in. diam., on bed rock, with marked (X) stone, for ¼ sec. cor.; and raise a mound of stone around post, with brass cap marked

Survey of Part of the Subdivision
of T. 28 N., R. 13 W.

Chains	
	S 22 $\frac{1}{4}$ S 23
	1921
	Continue ascent, 690 ft.
70.40	Spur, slopes SW. Desc. 125 ft.
80.00	Set an iron post, 3 ft. long, 2 ins. diam., 8 ins. in the ground, with marked (X) stone, for cor. of secs. 14, 15, 22 and 23; and raise a mound of stone around post, with brass cap marked
	T 28 N R 13 W
	S 15 | S 14
	S 22 | S 23
	1921
	Land, broken and rolling.
	Soil, rocky, 4th rate; limestone formation.
	Timber, willow, cottonwood and scrub oak in wash.
	Undergrowth, sagebrush, ocotillo, palo verde, mesquite, cactus, dogwood and greasewood.

As it is impossible to establish the $\frac{1}{4}$ sec. cor. bet. secs. 14 and 23 at the true point for cor., or a witness cor. within the prescribed limits, I leave the mile bet. secs. 14 and 23 unsurveyed.

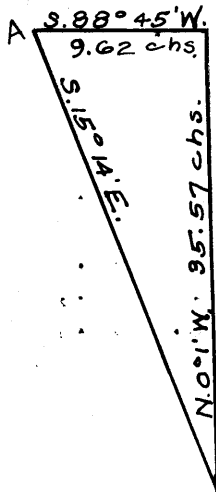| Chains	
	N. 0° 1' W., bet. secs. 14 and 15.
	Over rolling and broken land, through scattering undergrowth. Desc. 245 ft.
12.50	Draw, course W. Asc. 375 ft.
32.30	Foot of cliff, 500 ft. high, brs. NW. and SE. Impossible to continue on line. Traverse as follows:
	N. 45° W. 1.00 chs.
	N. 5° W. 1.28 "
	N. 30° E. 1.64 " to a point on sec. line,
	35.71 chs. N. 0° 1' W. of the cor. of secs. 14, 15, 22 and 23.
35.00	Foot of cliffs, 500 ft. high, brs. NE. and SW. Continue descent, 150 ft.
40.00	Set an iron post, 3 ft. long, 1 in. diam., 4 ins. in the ground, with marked (X) stone, for $\frac{1}{4}$ sec. cor.; and raise a mound of stone around post, with brass cap marked
	S 15 $\frac{1}{4}$ S 14
	1921
	Continue descent, 335 ft.
55.36	Impossible to chain from this point. Set a flag near the point for cor. of secs. 10, 11, 14 and 15, and a flag ahead on line, from which I measure a base S. 88 45'W., 9.62 chs. to a point "A", from which the 55.36 ch. point brs. S. 15° 14' E. The three angles of the triangle are therefore 15° 13', 76° 1' and 88° 46', the sum of which is 180°. The distance triangulated is given by the sine proportion:

$$\frac{X}{9.62} = \frac{\sin 76° 1'}{\sin 15° 13'}$$

|	
log 9.62	= .983175
log. sin. 76° 1'	= 9.986936
	0.970111
log. sin. 15° 13'	= 9.419079
log. X	= 1.551032
X	= 35.57 chs.,

A S.88°45'W.
9.62 chs.
S.15°14'E.
N.0°1'W. 35.57 chs.

Survey of Part of the Subdivision
of T. 28 N., R. 13 W.

Chains	
	which added to 55.36 chs., gives 90.93 chs. Thence measure S. 0° 1' E. 2.74 chs. to "B", 88.19 chs. N. 0° 1' W. of the cor. of secs. 14, 15, 22 and 23. From "B" set a flag "C" on a bearing S. 39° 13' W. and from "C" measure a base N. 30° 2' W., 5.00 chs. to point "D", from which "B" brs. N. 59° 58' E. The three angles of the triangle are 69° 15', 90° and 20° 45', the sum of which is 180°. The distance BC is found by
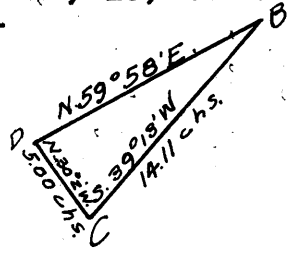
$$\frac{5.00}{\cos.69°\,15'} = \frac{5.00}{.35429} = 14.11$$

From "C" run line N. 16° W. 2.85 chs., to a point which by computation is found to be 9.71 chs. West of the true point for cor. of secs. 10, 11, 14 and 15.

From this point, flag on N. and S. line near the true point for cor. of secs. 10, 11, 14 and 15 brs. S. 85° 9' E. By computation, this flag is found to be 0.82 chs. S. 0° 1' E. of the true point for cor. of secs. 10, 11, 14 and 15.

Thence N. 0° 1' W., 0.70 chs. to a pt. 0.12 chs. S. 0° 1' E. of the true point for cor. of secs. 10, 11, 14 and 15, where I

| 79.88 | Set an iron post, 3 ft. long, 2 ins. diam., on bed rock, with cross (X) at exact cor. point, for witness cor. to cor. of secs. 10, 11, 14 and 15; and raise a mound of stone around post, with brass cap marked |

T 28 N   R 13 W
W   C
S 10 | S 11
S 15 | S 14
1921
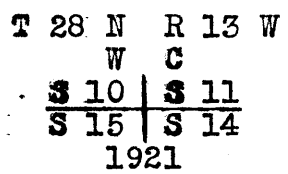
| 80.00 | True point for cor. of secs. 10, 11, 14 and 15, inaccessible |

At 73.70 chs., creek 15 lks. wide, 6 ins. deep, course N. 75° E., in bottom of Spencer Canyon.

Soil, rocky, 4th rate.
Land, mountainous.
No timber.
Undergrowth, sagebrush, ocotillo, palo verde, mesquite, cactus, dogwood and greasewood.

It is impossible to survey the line bet. secs. 11 and 14.

N. 0° 1' W., bet. secs. 10 and 11.
Over mountainous land, through scattering undergrowth.
I begin at the point 10.93 chs. N. 0° 1' W. of the true point for cor. of secs. 10, 11, 14 and 15, which point was determined as described in the field notes of mile bet. secs. 14 and 15. Asc. 65 ft.

| 18.45 | Spur, slopes SE. Desc. 85 ft. |
| 40.00 | Set an iron post, 3 ft. long, 1 in. diam., on bed rock, with cross (X) at exact cor. point, for ¼ sec. cor.; and raise a mound of stone around post, with brass cap marked |

S 10 ¼ S 11
1921
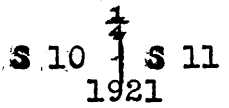
Survey of Part of the Subdivision
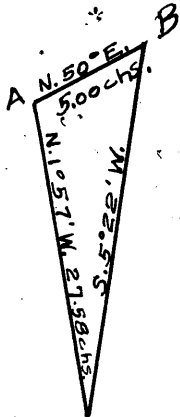of T. 28 N., R. 13 W.

Chains	
40.88	Rim of Grand Canyon, 825 ft. high, brs. NW. and SE.
56.00	Colorado River, 5 chs. wide, course N. 40° W.
	Land, mountainous.
	Soil, rolling and broken.
	No timber.
	Undergrowth, sagebrush, mescal, cactus, cat'claw and palo verde.

From the cor. of secs. 3, 4, 33 and 34, on the S. bdy.
   of Tp., described in Book "H"
N. 0° 2' W., bet. secs. 33 and 34.
Over rolling mesa, through dense undergrowth.
Desc. 30 ft.

| 14.04 | Head of draw, course NE. Asc. 30 ft. |
| 19.44 | Rim of canyon, brs. E. and W. Impossible to chain from this point. Set a flag, "A", ahead on a bearing N. 1° 57' W., from which set a flag "B" at N. 50° E., 5.00 chs. From "B" flag at 19.44 ch. point brs. S. 5° 22' W. The three angles of the triangle are therefore 7° 19', 128° 3' and 44° 38', the sum of which is 180°. The distance triangulated on the bearing N. 1° 57' W. is given from the sine proportion: |

$$\frac{X}{5.00} = \frac{\sin. 44° 38'}{\sin. 7° 19'}$$

log. 5.00   = 0.698970
log. sin. 7° 19' = 9.105010
                 1.593960
log. sin. 44° 38' = 9.846688
log. X   = 1.440648
X   = 27.58 chs.

to triangulation point on S. edge of rocky wash, 1
ch. wide, course N. 50° E., 1280 ft. below 19.44 ch.
point,
         Thence   East 0.93 chs. and
                  South 7.01 chs. to the true point for ¼
sec. cor., where I
Set an iron post, 3 ft. long, 1 in. diam., on bed rock,
   with cross (X) at exact cor. point, for ¼ sec. cor.;
   and raise a mound of stone around post, with brass
   cap marked

                S 33 │ S 34
                  1921
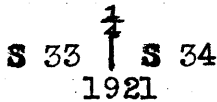
In order to complete the survey of the mile bet. secs.
   33 and 34, I set a flag near the point for cor. of
               secs. 27, 28 33 and 34, but West
               of line, from which a flag 13.24
               chs. South of the cor. of secs.
               3, 4, 33 and 34, brs. S. 4° 49'
               E., and a flag 17.75 chs. N. 66°
               01½' W. of this flag brs. S. 5°
               33½' W. The three angles of the
               triangle are therefore 61° 12½',
               108° 25' and 10° 22½', the sum of
               which is 180°. The dist. trian-
               gulated on the bearing N. 4° 49'
               W. is found by the sine pro-
               portion:
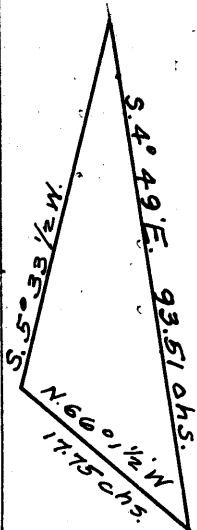
$$\frac{X}{17.75} = \frac{\sin. 108° 25'}{\sin. 10° 22½'}$$

Survey of Part of the Subdivision
of T. 28 N., R. 13 W.

Chains		

log. 17.75   = 1.249198
log. sin. 10° 22½'   = 9.255489
                             1.993709
log. sin. 108° 25'   = 9.977167
log. X   = 1.970876
X   = 93.51 chs.

Thence North 0.05 chs. to a point 7.80 chs. S. 89° 55'
    W. of the true point for cor. of secs. 27, 28, 33 and
    34, where I
Set an iron post, 3 ft. long, 2 ins. diam., on bed rock,
    with cross (X) at exact cor. point, for witness cor.
    to cor. of secs. 27, 28, 33 and 34; and raise a mound
    of stone around post, with brass cap marked

$$T\ 28\ N\quad R\ 13\ W$$
$$\begin{array}{c|c} S\ 28 & S\ 27 \\ \hline S\ 33 & S\ 34 \end{array}\ W\ C$$
$$1921$$

Land, mountainous.
Soil, rocky, 4th rate.
No timber.
Undergrowth, sagebrush, palo verde, cat claw, mescal
    and cactus.

Impossible to survey the line bet. secs. 27 and 34 by
    the ordinary methods of surveying. From a point 7.85
    chs. West and 0.16 chs. South of the true point for
    cor. of secs. 27, 28, 33 and 34, point "A", set a
    flag "B" on a bearing S. 85° 35' E. From "B" measure
    a base North 9.62 chs. to point "C", from which "A"
    brs. S. 79° 14' W. From "B", measure North 2.98 chs.;
    thence S. 89° 48' E. 11.88 chs., to a point 40.00 chs.
    East of the true point for cor. of secs. 27, 28, 33
    and 34, where I set temp. ¼ sec. cor. Return to
    point "B". From "B", a natural object brs. N. 68° 35'
    E.; from "C", same object "D", brs. N. 86° E. From
    point "E", 21.55 chs. East of the cor. of secs. 26,
    27, 34 and 35, point "D" brs. N. 78° 5' W. From point
    "F", which is 0.40 chs. West and 37.10 chs. North of
    the cor. of secs. 26, 27, 34 and 35, point "D" brs.
    S. 37° 23' W.
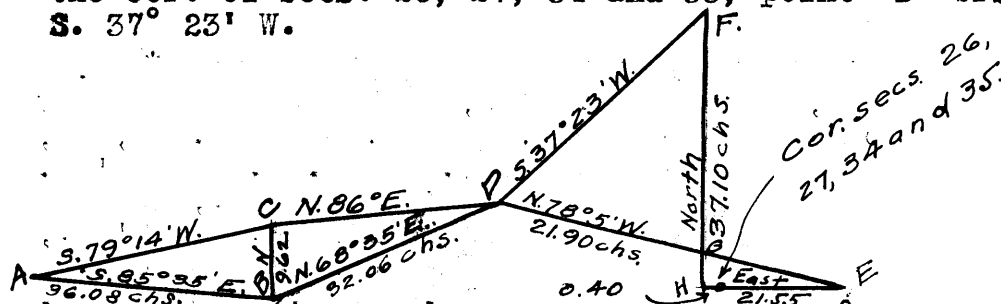
In the triangle ABC, the three angles are 15° 11', 79° 14'
    and 85° 35', the sum of which is 180°. The distance
    "AB" is found from the sine proportion:

$$\frac{X}{9.62} = \frac{\sin 79°\ 14'}{\sin 15°\ 11'}$$

log. 9.62   = 0.983175
log. sin. 15° 11' = 9.418150
                     1.565025
log. sin. 79° 14' = 9.992287
log. X   = 1.557312
X   = 36.08 chs.

The length of the line "BD" is found from the triangle
    whose angles are 94°, 17° 25' and 68° 35', and the
    sum 180°.

$$\frac{X}{9.62} = \frac{\sin 94°}{\sin 17°\ 25'}$$

Survey of Part of the Subdivision
of T. 28 N., R. 13 W.

Chains		
	log. 9.63	= 0.983175
	log. sin. 17° 25'	= 9.476133
		1.507042
	log. sin. 94°	= 9.998941
	log. BD	= 1.505983
	BD	= 32.06 chs.

The length "HG" - see diagram - is found by tan. 11° 55'
X 21.95 = .21104 X 21.95 = 4.53 chs. The length GF
is therefore 32.57 chs. The length DG is found from
the triangle DFG, whose angles are 64° 32', 37° 23'
and 78° 5', their sum being 180°.

$$\frac{X}{32.57} = \frac{\sin. 37° 23'}{\sin. 64° 32'}$$

	log. 32.57	= 1.512818
	log. sin. 64° 32'	= 9.955609
		1.557209
	log. sin. 37° 23'	= 9.783292
	log. DG	= 1.340501
	DG	= 21.90 chs.

By computing the latitudes and departures of these
courses, the falling of the theoretical random is

79.80 Intersect N. and S. line, 29 lks. N. of the cor. of secs.
26, 27, 34 and 35.
Thence,
N. 89° 48' W., on a true line bet. secs. 27 and 34.
Over mountainous land, through scattering undergrowth,
distance by traverse and triangulation, as herein-
before described.

39.90 Set an iron post, 3 ft. long, 1 in. diam., 6 ins. in
the ground, with marked (X) stone, for ¼ sec. cor.;
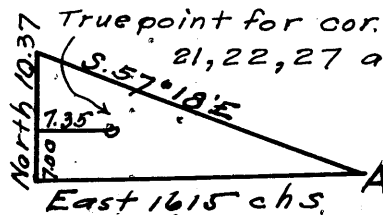and raise a mound of stone around post, with brass
cap marked

¼ · S 27
S 34
1921

79.80 The true point for cor. of secs. 27, 28, 33 and 34.
Soil, rocky, 4th rate.
No timber. Land, mountainous.
Undergrowth, sagebrush, ocotillo, mescal and cactus.

As it is impossible to measure the line bet. secs. 27 and
28, on the sec. line, I proceed as follows:
From the witness cor. to cor. of secs. 27, 28, 33 and 34,
7.80 chs. S. 89° 55' W. of the true
point for cor., set a flag "A" on
a bearing N. 0° 33' W., and from
"A" measure a base S. 89° 27' W.,
15.00 chs., from the W. end of
which, flag at the witness cor. brs.
S. 17° 59' E. The three angles of
the triangle are therefore 17° 26',
72° 34', and 90°, the sum of which
is 180°. The distance triangulated
is given by tan. 72° 34' X 15.00 =
3.18451 X 15.00 =

S.89°27'W
15.00chs.
N.0°33'W
S.17°59'E 47.77 chs.
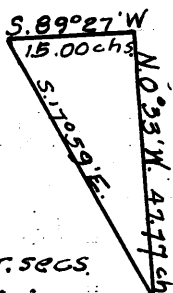
Witness cor. to cor. secs.
27, 28, 33 and 34

47.77 Thence   South   7.76 chs. and
East   8.26 chs. to the true point for ¼
sec. cor., where I
40.00 Set an iron post, 3 ft. long, 1 in. diam., 6 ins. in the
ground, with marked (X) stone, for ¼ sec. cor., and
raise a mound of stone around post, with brass cap
marked

S 28 ¼ S 27
1921

Survey of Part of the Subdivision
of T. 28 N., R. 13 W.

Chains	
	From the 47.77 ch. point, I continue N. 0° 33' W., on offset line through sec. 28. Over rolling land, through scattering undergrowth. Desc. gradually.
80.00	Thence East 0.02 chs. to a point 8.50 chs. N. 89° 56' W., of the true point for cor. of secs. 21, 22, 27 and 28, on rim of cliff, 400 ft. high, bearing NW. and SE., where I
	Set an iron post, 3 ft. long, 2 ins. diam., on bed rock, with cross (X) at exact cor. point, for witness cor. to cor. of secs. 21, 22, 27 and 28; and raise a mound of stone around post, with brass cap marked

```
        T 28 N    R 13 W
          S 21 | S 22
          S 28 | S 27   W C
             1921
```

Land, mountainous and rolling.
Soil, rocky, 4th rate; limestone formation.
Timber, none.
Undergrowth, sagebrush, greasewood, ocotillo, cactus, cat claw, palo verde, dogwood.

Impossible to measure the line bet. secs. 22 and 27 on the line. From a point 7.35 chs. West and 7.00 chs. South of the true point for cor. of secs. 21, 22, 27 and 28, set flag "A" to the East. From starting point measure a base North 10.37 chs., from the N. end of which, "A" brs. S. 57° 18' E. The three angles of the triangle are therefore 32° 42', 90° and 57° 18', the sum of which is 180°.

True point for cor. secs. 21,22,27 and 28.
S. 57° 18' E
North 10.37
7.35
7.00
East 16.15 chs.
A

The distance triangulated is given by tan. 57° 18' X 10.37 = 1.55766 X 10.37 = 16.15 chs.

	Thence North 7.00 chs., to a point 8.80 chs. East of the true point for cor. of secs. 21, 22, 27 and 28, from which I continue.
	East on a random line, bet. secs. 22 and 27.
40.00	Set temp. ¼ sec. cor.
80.00	Intersect N. and S. line, 21 lks. S. of the cor. of secs. 22, 23, 26 and 27.
	Thence, S. 89° 51' W., on a true line, bet. secs. 22 and 27. Over mountainous land, through scattering undergrowth. Desc. over cliffs.
5.00	Center of wash, 2 chs. wide, course N. 10° W. in Spencer Canyon. Creek, 15 lks. wide, course NW. Asc.
22.80	Spur, slopes NE. Desc. 250 ft.
40.00	Set an iron post, 3 ft. long, 1 in. diam., on bed rock, with cross (X) at exact cor. point, for ¼ sec. cor.; and raise a mound of stone around post, with brass cap marked

```
        S 22
    ¼ ――――――
        S 27
        1921
```

Desc.

42.40	Center of wash, 150 lks. wide, course NE. Asc. 325 ft.
71.20	Thence by triangulation as hereinbefore described.
80.00	The true point for cor. of secs. 21, 22, 27 and 28.

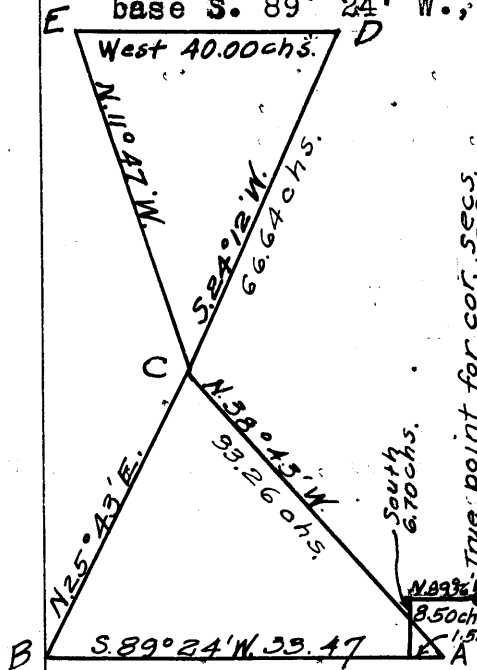Land, mountainous.
Soil, rocky, 4th rate.
No timber.
Undergrowth, sagebrush, ocotillo, mescal and cactus.

Survey of Part of the Subdivision
of T. 28 N., R. 13 W.

Chains	
	Impossible to measure the line bet. secs. 21 and 22 by the usual methods of surveying. From the witness cor. to cor. of secs. 21, 22, 27 and 28, 8.50 chs. N. 89° 56' W. of the true point for said cor., run South 6.70 chs. and East 1.50 chs. to flag "A", from which natur-al object "C" brs. N. 38° 43' W. From "A" measure a base S. 89° 24' W., 33.47 chs. to "B", from which "C" brs. N. 25° 43' E. From "D" a point in the vicinity of the point for cor. of secs. 15, 16, 21 and 22, natural object "C" brs. S. 24° 12' W. From "D" measure a base West 40.00 chs., to "E", from which "C" brs. S. 11° 47' E. In triangle ABC, the three angles are 63° 41', 64° 26' and 51° 53', the sum of which is 180°. The length AC is found from the sine propor-tion:

$$\frac{X}{33.47} = \frac{\sin. 63° 41'}{\sin. 64° 26'}$$

log. 33.47	= 1.524656
log. sin. 64° 26'	= 9.955247
	1.569409
log. sin. 63° 41'	= 9.952481
log. X	= 1.521890
X	= 33.26 chs.

In triangle CDE, the three angles are 35° 59', 78° 13' and 65° 48', the sum of which is 180°. The distance CD is found from the sine proportion:

$$\frac{X}{40.00} = \frac{\sin. 78° 13'}{\sin. 35° 59'}$$

log. 40.00	= 1.602060
log. sin. 35° 59'	= 9.769045
	1.833015
log. sin. 78° 13'	= 9.990750
log. X	= 1.823765
X	= 66.64 chs.

From point "D",   East   0.43 chs.
         South   .04 "   To the point for
cor. of secs. 15, 16, 21 and 22, where I
Set an iron post, 3 ft. long, 2 ins. diam., on surface
rock, with cross (X) at exact cor. point, for cor. of
secs. 15, 16, 21 and 22; and raise a mound of stone
around post, with brass cap marked

T 28 N   R 13 W

S 16	S 15
S 21	**S 22**

1921
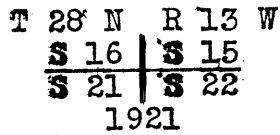
From this cor., S. 0° 2' E. to determine witness cor. to
¼ sec. cor.
Over mountainous land, through scattering undergrowth.
Desc. 55 ft.

5.00	Wash, course SE. Asc. 515 ft., over NE. slope.
30.63	Foot of cliff, 300 ft. high, brs. E. and W. Set an iron post, 3 ft. long, 1 in. diam., 10 ins. in the ground, with cross (X) on face of cliff at top of post, for witness cor. to ¼ sec. cor.; and raise a mound of stone around post, marked on brass cap
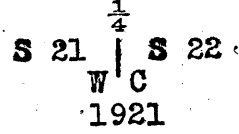
¼

S 21	S 22
W	C

1921

Land, mountainous.
Soil, rocky, 4th rate.
Timber, none.
Undergrowth, sagebrush, greasewood, ocotillo, cactus,
    cat claw, palo verde and dog wood.

Survey of Part of the Subdivision
of T. 28 N., R. 13 W.

Chains	N. 89° 51' E., on a random line, bet. secs. 15 and 22.
40.00	Set temp. ¼ sec. cor.
80.02	Intersect N. and S. line, 19 lks. N. of the cor. of secs. 14, 15, 22 and 23.

Thence
S. 89° 59' W., on a true line, bet. secs. 15 and 22.
Over mountainous land, through scattering undergrowth.
Desc.

20.00	Wash, in Spencer Canyon, course N. Asc. along S. slope.
30.50	Draw, course SE. Asc. 100 ft.
34.10	Spur, slopes NE. Desc. 95 ft.
38.60	Same draw, course NE. Asc. 85 ft.
40.01	Set an iron post, 3 ft. long, 1 in. diam., on bed rock, with cross (X) at exact cor. point, for ¼ sec. cor.; and raise a mound of stone around post, with brass cap marked

$$\tfrac{1}{4} \; \frac{\text{S } 15}{\text{S } 22}$$
1921

Continue ascent, 175 ft.

44.20	Spur, slopes SE. Desc. 90 ft.
49.00	Bend in same wash, course SE. from SW. Asc. 270 ft.
71.00	Spur, slopes S. Desc. 50 ft.
79.50	Draw, course S. Asc.
80.02	The cor. of secs. 15, 16, 21 and 22.

Land, mountainous.
Soil, rocky, 4th rate.
No timber.
Undergrowth, sagebrush, greasewood, ocotillo, cactus, cat claw, palo verde and dog wood.

As it is impossible to set the ¼ sec. cor. for secs. 15 and 16, or a witness cor. within the prescribed limits, and as the remainder of the mile cannot be surveyed, I abandon the survey at this cor.

From the true point for cor. of secs. 10, 11, 14 and 15 (inaccesible).
S. 89° 59' W., on a true line, bet. secs. 10 and 15.
Over mountainous land, through scattering undergrowth.
Impossible to chain. I begin at the point 9.71 chs. West of the true point for cor. of secs. 10, 11, 14 and 15, described in the field notes of the survey of the mile bet. secs. 14 and 15. I adjust this point to be 9.71 chs. S. 89° 59' W. of the true point for cor. of secs. 10, 11, 14 and 15, and continue S. 89° 59' W., on a true line, bet. secs. 10 and 15. Asc. 450 ft.

| 39.90	Set an iron post, 3 ft. long, 1 in. diam., on bed rock, with cross (X) on face of cliff at top of post, for witness cor. to ¼ sec. cor.; and raise a mound of. stone around post, marked with brass cap

$$\text{W C } \tfrac{1}{4} \; \frac{\text{S } 10}{\text{S } 15}$$
1921

True point for ¼ sec. cor. falls on cliff, 30 ft. high, bearing NW. and SE.
I discontinue the survey of this mile at this point.
Land, mountainous.
Soil, rocky, 4th rate; limestone formation.
No timber.
Undergrowth, sagebrush, cactus, cat claw, palo verde, dog wood and ocotillo.

Survey of Part of the Subdivision
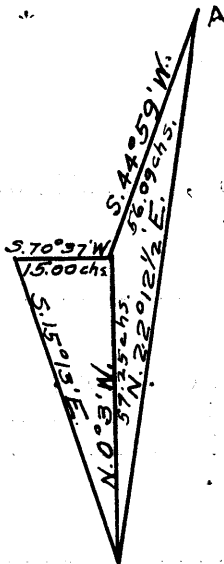## of T. 28 N., R. 13 W.

Chains	
	From the cor. of secs. 4, 5, 32 and 33, on the S. bdy. of Tp., described in Book "H"
	N. 0° 3' W., bet. secs. 32 and 33.
	Over rolling mesa, through scattering timber and dense undergrowth.
27.54	South rim of small canyon, brs. E. and W. Desc. 200 ft.
30.24	Wash in bottom of canyon, 30 lks. wide, course N. 70° E. Asc. 160 ft.
40.00	Set an iron post, 3 ft. long, 1 in. diam., 8 ins. in the ground, with marked (X) stone, for ¼ sec. cor.; and raise a mound of stone around post, with brass cap marked

$$\frac{1}{4}$$

S 32 | **S** 33
1921
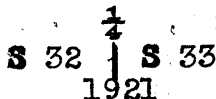
Continue ascent, 10 ft.

40.54	North rim of canyon, brs. E. and W. Desc. 30 ft.
49.04	Head of draw, course E.
55.94	South rim of Meriwhitica Canyon, brs. NE. and SW. Impossible to chain from this point. From this point flag "A" brs. N. 22° 12½' E. Set a flag ahead on a bearing N. 0° 3' W.; from which the flag "A" brs. N. 44° 59' E., 56.09 chs. From point on line, measure a

base S. 70° 37' W. 15.00 chs.,
from which flag at 55.94 ch. point
brs. S. 15° 13' E. In the triangle
with the 56.09 ch. base, the three
angles are 22° 15½', 134° 58' and
22° 46½', the sum of which is 180°.
The distance triangulated along the
sec. line is given from the sine
proportion:

$$\frac{X}{56.09} = \frac{\sin. 22° 46½'}{\sin. 22° 15½'}$$

log. 56.09 = 1.748885
log. sin. 22° 15½' = 9.578390
2.170495
log. sin. 22° 46½' = 9.587839
log. X = 1.758334
X = 57.32 chs.

The same distance from the other triangulation is computed from the sine proportion:

$$\frac{X}{15.00} = \frac{\sin. 94° 10'}{\sin. 15° 10'}$$

log. 15.00 = 1.176091
log. sin. 15° 10' = 9.417684
1.758407
log. sin. 94° 10' = 1.998851
log. X = 1.757258
X = 57.18 chs. As these

two triangulations have the same weights, I take the
mean, 57.25 chs. as the true distance, which added to
55.94 chs., gives 113.19 chs. N. 0° 3' W. of the cor.
of secs. 28, 29, 32 and 33.
Thence S. 0° 3' E., 33.19 chs. to

80.00	Set an iron post, 3 ft. long, 2 ins. diam., 14 ins. in the ground, with marked (X) stone, for cor. of secs. 28, 29, 32 and 33; and raise a mound of stone around post, with brass cap marked:

Chains	
	T28N R13W
	S29 | S28
	S32 | S33
	1921
	Land, mountainous.
	Soil, rocky, 4th rate.
	Timber, none.
	Undergrowth, greasewood, sagebrush and cactus.
	No grass.
	From this cor.,SW.cor.of Indian Farm brs.N.43°E.
	Spring brs. N.50°E.

East on a random line, bet. secs. 28 and 33.

40.00 Set temp. ¼ sec. cor. Impracticable to chain from this point. Set a flag ahead on line, and from the ¼ sec. cor., measure a base North 10.00 chs.,from which flag brs.S.72°9'E. The three angles of the triangle are therefore 90°, 72°9' and 17°51', the sum of which is 180°. The distance triangulated is given by
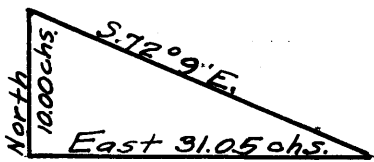
tan. 72°9' X 10.00 = 3.10532 X 10.00 = 31.05 chs.,which added to 40.00 chs.,gives.

71.05 Continue East on a random line, bet. secs. 28 and 33.

79.64 Intersect N. and S. line, 11 lks. S. of the true point for cor.of secs.27,28,33 and 34,witnessed 7.80 chs.West as hereinbefore described.

From the true point for cor.
S.89°55'W.on a true line, bet. secs. 28 and 33.
Over mountainous land, through scattering undergrowth.
Distance to witness cor.determined as described in the field notes of mile bet.secs.33 and 34;thence by triangulation, as hereinbefore described.

39.82 Set an iron post, 3 ft.long,1 in.diam.,on bed rock, with cross (X) at exact cor.point,for ¼ sec.cor.;and raise a mound of stone around post,with brass cap marked

¼ _S 28_
   S 33
   1921

Desc. 385 ft.

58.05 Draw, course N. Asc. 165 ft.

64.75 Spur, slopes N. Desc. 245 ft.

77.45 Draw, course NE. Asc. 50 ft.

79.64 The cor. of secs. 28, 29, 32 and 33.
Land, mountainous.
Soil, rocky, 4th rate.
Timber, none.
Undergrowth, greasewood, sagebrush and cactus.
No grass.

N.0°3'W. bet. secs. 28 and 29.
Over mountainous land, through scattering undergrowth.
Desc. 95 ft.

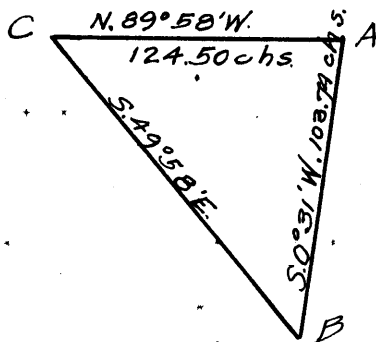**33.19** From this point, spring at Indian Farm brs.N.77°45'E.

40.00 Set an iron post, 3 ft.long,1 in.diam.,26 ins.in the ground, for ¼ sec.cor.,marked on brass cap

¼
S29 \| S28

1921

Chains

And raise a mound of stone, 2 ft.base, 1½ ft.high, W.
of cor.
Impracticable to chain from this point.   From a point "A"
in the vicinity of the true
point for cor. of secs. 20,
21, 28 and 29, flag "B" at
the 55.94 ch.point bet.
secs. 32 and 33 brs. S.0°
31'W. From "A" measure a
base N.89°58'W. 124.50 chs.
to "C", from which "B" brs.
S.49°58'E.   The three an-
gles of the triangle are
therefore 50°29', 40° and
89°31', the sum of which
is 180°.   The distance tri-
angulated is given by the
sine proportion:

$$\frac{X}{124.50} = \frac{Sin. \ 40°}{Sin. \ 50°29'}$$

log. 124.50 = 2.095169
log.sin.50°29' = 9.887302
                 2.207867
log.sin.40°00' = 9.808067
log.X = 2.015934
X = 103.74 chs., which added to
55.94 chs., gives 159.68 chs., or 79.68 chs.from the cor.
of secs.28, 29, 32 and 33.
Thence

North   0.32 chs. and
West   1.03 chs. to the true point for
cor. of secs. 20, 21, 28 and 29, where I
Set an iron post, 3 ft. long, 2 ins.diam., on bed rock,
with cross (X) at exact cor.point, for cor. of secs.
20, 21, 28 and 29; and raise a mound of stone around post,
with brass cap marked

T28N | R13W
S20 | S21
S29 | S28
1921

Land, mountainous and broken.
Soil, rocky, 4th rate.
No timber.
Undergrowth, sagebrush, greasewood, ocotillo, cactus, cat
claw, palo verde and dogwood.

In order to survey the line bet.secs.21 and 28, I pro-
ceed as follows:
From the cor. of secs. 20, 21, 28 and 29.

South   0.32 chs. and
East   1.09 chs.,to point "A",from
which it is impossible
to chain. Set Flag "B"
on a bearing S.89°30'E.
and from "B" measure a
base S.18°42'W.,12.20
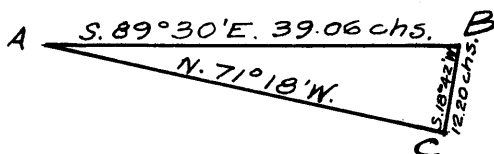chs.to "C",from which
"A"brs.N.71°18'W. The
three angles of the tri-
angle are therefore
18°12',71°48' and 90°,
the sum of which is 180°.
The distance triangulated
is given by

$$\frac{12.20}{cos. \ 71°48'} =$$

Survey of Part of the Subdivision
of T. 28 N., R. 13 W.

Chains	
	$\frac{12.20}{.31233} = 39.06$ chs.

From "B", S. 5° 00' W.   6.40 chs.
Thence   East   31.97 chs.
Thence   N. 0° 30' W.   6.97 chs.
Thence   East   8.50 chs.   To the true
    point for cor. of secs. 21, 22, 27 and 28, witnessed 8.50
    chs. West as hereinbefore described.
From a computation of the traverse herein given, the re-
    turn course is found to be N. 89° 56' W. and the length
    80.00 chs.
From the true point for cor.,
N. 89° 56' W., on a true line, bet. secs. 21 and 28.
Over mountainous land, through scattering undergrowth.

40.00   Set an iron post, 3 ft. long, 1 in. diam., on bed rock,
    with marked (X) stone, for ¼ sec. cor.; and raise a
    mound of stone around post, with brass cap marked

$$\frac{1}{4} \quad \frac{\text{S } 21}{\text{S } 28}$$

1921

From a point 7.06 chs. S. of this cor.,
    Spring brs. S. 30° E.
    Indian Village brs. S. 10° W.
    Peach Orchard brs. S. 9° E.

80.00   The cor. of secs. 20, 21, 28 and 29.
Land, mountainous.
Soil, rocky, 4th rate.
Timber, none.
Undergrowth, sagebrush, greasewood, ocotillo, cactus,
    cat claw, palo verde and dog wood.

N. 0° 3' W., bet. secs. 20 and 21.
Over mountainous land, through scattering undergrowth.
Desc.

11.11   Rim of canyon, 500 ft. high, brs. NE. and SW.   Impossible
    to chain from this point.   Set
    a flag ahead on line, from
    which I measure a base S. 89°
    57' W. 10.00 chs., from the W.
    end of which flag at 11.11 chs.
    brs. S. 17° 17' E.   The three
    angles of the triangle are
    therefore 17° 14', 72° 46' and
    90°, the sum of which is 180°.
    The distance triangulated is
    given by tan. 72° 46' X 10.00
    = 3.22384 X 10.00 = 32.24 chs.,
    which added to 11.11 chs., gives

S. 89° 57' W. 10.00 chs.
S. 17° 17' E.
N. 0° 3' W. 32.24 chs.
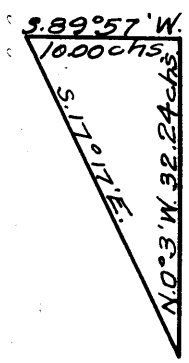
43.35   Triangulation point.   Thence S. 0° 3' E., 3.35 chs. to
40.00   Set an iron post, 3 ft. long, 1 in. diam., on bed rock,
    with marked (X) stone, for ¼ sec. cor.; and raise a
    mound of stone around post, with brass cap marked
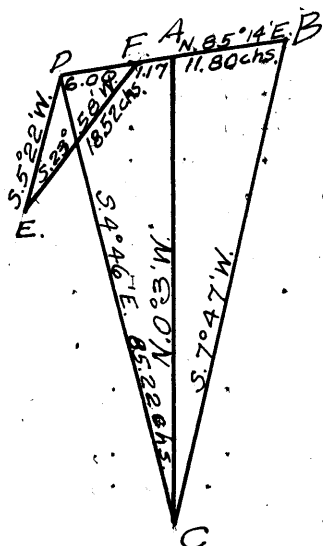
$$\frac{1}{4}$$

S 20 | S 21
1921

This cor. is 1500 ft. below rim of canyon.

42.85   Enter wash, course N. 65° E.
47.35   Leave wash. Impossible to chain from this point. I set
    a flag ahead on line beyond the cor. of secs. 16, 17,
    20 and 21, at point "A", from which I measure N. 85°
    14' E., 11.80 chs. to point "B", from which flag "C"
    at the 11.57 ch. point brs. S. 7° 47' W.   From "A"

Survey of Part of the Subdivision
of T. 28 N., R. 13 W.

Chains	

project base in opposite direction S. 85° 14' W. 7.17 chs. to "D" from which "C" brs. S. 4° 46' "E". The three angles of the triangle are therefore 12° 33', 90° and 77° 27', the sum of which is 180°. The dist. DC is given by tan. 77° 27' X 18.97 = 4.49215 X 18.97 = 85.22 chs. From "D", flag "E" brs. S. 5° 22' W., and from "F", which is 6.00 chs. N. 85° 14' E. of "D", "E" brs. S. 23° 58' W. The three angles of this triangle are therefore 100° 8', 61° 16' and 18° 36', the sum of which is 180°. The distance triangulated on the course S. 23° 58' W., is given by the sine proportion:

$$\frac{X}{6.00} = \frac{\sin. 100° 8'}{\sin. 18° 36'}$$

log. 6.00	= 0.778151
log. sin. 100° 8'	= 9.993172
	0.771323
log. sin. 18° 36'	= 9.503735
log. X	= 1.267588
X	= 18.52 chs.

From point "E", measure
      South   .07 chs. and
      West   .57 "   to a point 9.13
chs. N. 89° 57' W., of the true point for cor. of secs. 16, 17, 20 and 21, where I
Set an iron post, 3 ft. long, 2 ins. diam., on bed rock, with cross (X) at exact cor. point, for witness cor. to cor. of secs. 16, 17, 20 and 21; and raise a mound of stone around post, with brass cap marked
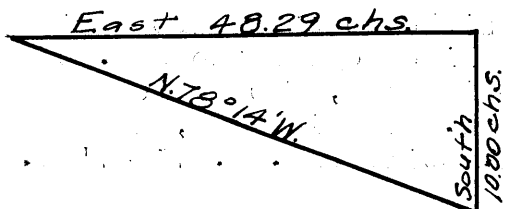
T 28 N R 13 W

S 17	S 16	
S 20	S 21	W C

1921

Land, mountainous.
Soil, rocky, 4th rate.
Timber, none.
Undergrowth, sagebrush, greasewood, ocotillo, cactus, cat claw, palo verde and dogwood.

From a point 1 lk. south of the witness cor. to cor. of secs. 16, 17, 20 and 21, 9.13 chs. N. 89° 57' W., of the true point for cor. of these secs., which point is inaccessible,
East, on a random line, bet. secs. 16 and 21.

0.32 Impracticable to chain from this point. Set a flag ahead on line, from which I measure a base South 10.00 chs., from the S. end of which, flag at 0.32 chs. point brs. N. 78° 18' W. The three angles of the triangle are therefore 78° 18', 11° 42' and 90°, the sum of which is 180°. The distance tri-

Survey of Part of the Subdivision
of T. 28 N., R. 13 W.

Chains	
	angulated is given by tan. 78° 18' X 10.00 = 4-.82882 X 10.00 = 48.29 chs., or 39.48 chs. East of the true point for cor. of secs. 16, 17, 20 and 21.
39.16	Continue East on a random line, bet. secs. 16 and 21.
40.00	Set temp. ¼ sec. cor.
79.76	Intersect N. and S. line, 16 lks. S. of the cor. of secs. 15, 16, 21 and 22.
	Thence
	S. 89° 53' W., on a true line, bet. secs. 16 and 21.
	Over mountainous land, through scattering undergrowth.
	Asc. 390 ft.
36.71	Spur, slopes SE. Desc.
39.88	Set an iron post, 3 ft. long, 1 in. diam., on bed-rock, with marked (X) stone, for ¼ sec. cor.; and raise a mound of stone around post, with brass cap marked

$$\frac{1}{4}\ \frac{\text{S 16}}{\text{S 21}}$$
$$1921$$

	Foot of cliff, bearing E. and W., brs. N. 0.50 chs. dist.
	Continue over mountainous land, distance by triangulation.
53.00	(Approx.) Gulch, course SE.
60.00	(Approx.) Foot of cliffs, brs. NE. and S. Asc.
79.76	The true point for cor. of secs. 16, 17, 20 and 21.
	Land, mountainous.
	Soil, rocky, 4th rate; limestone formation.
	No timber.
	Undergrowth, sagebrush, palo verde, cactus, cat claw, ocotillo and mescal.

	From the true point for cor. of secs. 16, 17, 20 and 21.
	N. 0° 3' W., bet. secs. 16 and 17.
	Over mountainous land, through scattering undergrowth.
	Asc., distance by triangulation. Distance to point "A" set in triangulation of mile bet. secs. 20 and 21 is found from

$$\frac{85.22}{\cos.\ 4°\ 43'} =$$

$$\begin{aligned}
\log.\ 85.22 &= 1.930542 \\
\log.\ \cos.\ 4°\ 43' &= 9.998527 \\
\log.\ X &= 1.932015 \\
X &= 85.51\ \text{chs.}
\end{aligned}$$

which added to 11.57 chs., gives 97.08 chs., or 17.08 chs. N. 0° 3' W. of the true point for cor. of secs. 16, 17, 20 and 21.

17.08	Continue N. 0° 3' W., distance by chaining. Asc. 175 ft.
40.00	Spur, slopes SE. Set an iron post, 3 ft. long, 1 in. diam., 12 ins. in the ground, with marked (X) stone, for ¼ sec. cor.; and raise a mound of stone around post, with brass cap marked

$$\text{S 17}\ \big|\ \overset{\frac{1}{4}}{}\ \text{S 16}$$
$$1921$$

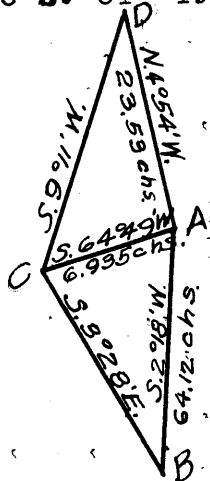|	
	Desc. 80 ft.
48.40	Head of draw, course SE. Asc. 45 ft.
51.20	Ridge, brs. E. and W. Desc. 205 ft.
58.54	Impracticable to chain from this point. Set flag for triangulation.
	It is impossible to set a cor. for secs. 8, 9, 16 and 17, or a witness cor. in any direction within the prescribed limits.
	Land, mountainous.
	Soil, rocky, 4th rate.
	Timber, none.
	Undergrowth, sagebrush, greasewood, ocotillo, cactus, cat claw, palo verde and dogwood.

Survey of Part of the Subdivision
of T. 28 N., R. 13 W.

Chains	
	The line bet. secs. 9 and 16 cannot be surveyed.

In order to survey the line bet. secs. 8 and 9, I proceed as follows:

From the point "A" near the true point for ¼ sec. cor. of secs. 8 and 9, flag "B" at the 58.54 ch. point bet. secs. 16 and 17 brs. S. 2° 18' W. From "A" measure a base S. 64° 49' W., 6.935 chs., to point "C", from which "B" brs. S. 3° 28' E. The three angles of the triangle are therefore 5° 46', 111° 43' and 62° 31', the sum of which is 180°. The distance triangulated on the bearing N. 2° 18' E. is given by the sine proportion:

$$\frac{X}{6.935} = \frac{\sin. 111° 43'}{\sin. 5° 46'}$$

log. 6.935 = 0.841046
log. sin. 111° 43' = 9.968027
0.809073
log. sin. 5° 46' = 9.002069
log. X = 1.807004
X = 64.12 chs.

From "A", West 2.62 chs. and South 2.61 chs., to the true point for ¼ sec. cor., where I

Set an iron post, 3 ft. long, 1 in. diam., 6 ins. in the ground, with marked (X) stone, for ¼ sec. cor.; and raise a mound of stone around post, with brass cap marked

S 8 | ¼ | S 9
1921

From "A" set a flag ahead on a bearing N. 4° 54' W. at point "D", from which "C" brs. S. 9° 11' W. The three angles of the triangle are therefore 55° 38', 14° 5' and 110° 17', the sum of which is 180°. The distance triangulated on the course N. 4° 54' W. is found from the sine proportion:

$$\frac{X}{6.935} = \frac{\sin. 55° 38'}{\sin. 14° 5'}$$

log. 6.935 = 0.841046
log. sin. 55° 38' = 9.916687
0.757733
log. sin. 14° 5' = 9.386201
log. X = 1.371532
X = 23.53 chs.

Thence West .64 chs. to a point on sec. line, 66.05 chs. N. 0° 3' W. of the true point for cor. of secs. 8, 9, 16 and 17. The approximate topography from the ¼ sec. cor. is as follows:

Chains	
48.00	Rim of canyon, brs. NW. and SE.
66.00	Rim of canyon, brs. NE. and SW.
66.05	From this point, distance by chaining.

Survey of Part of the Subdivision
of. T. 28. N., R. 13. W.

219

8557

31

Chains	
78.00	Desc. 100 ft., over N. slope.
80.00	Gulch, course N.70°E. Asc. 60 ft.
	Set an iron post, 3 ft. long, 2 ins. diam., 14 ins.in the ground,with marked (x) stone, for cor.of secs.4,5,8 and 9;and raise a mound of stone around post,with brass cap marked

T28N R13W
S 5 | S 4
S 8 | S 9
1921

Land, mountainous.
Soil, rocky, 4th rate.
No timber.
Undergrowth, sagebrush and cactus.
No grass.

Impossible to survey the line bet. secs. 4 and 9.

	N.0°3'W.on a random line, bet. secs. 4 and 5.
40.00	Set temp. ¼ sec. cor.
40.84	Impracticable to chain from this point. Set a flag ahead
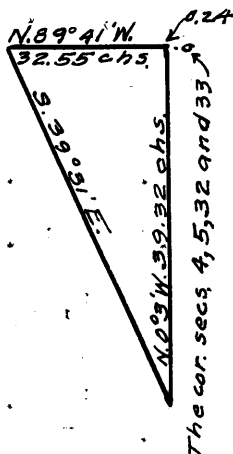
on a bearing N.0°3'W. at the cor.of secs.4,5,32 and 33,from which I measure a base N.89°41'W., 32.55 chs.,from W.end of base, flag at the 40.84 ch.point brs. S.39°31'E. The three angles of the triangle are therefore 39°28',50°10'and 90°22',the sum of which is 180°. The distance triangulated is given by the sine proportion:

$$\frac{X}{32.55} = \frac{\sin. 50°10'}{\sin. 39°28'}$$

log. 32.55 = 1.512551
log.sin. 50°10' = 9.885311
⎯⎯⎯⎯⎯⎯⎯
1.620446
log.sin.39°28' = 9.803204
⎯⎯⎯⎯⎯⎯⎯
log. X = 1.594658
X = 39.32 chs.,which added to 40.84 chs.,gives

80.16	Fall 24 lks.W.of the cor.of secs.4,5,32 and 33,on the N.bdy.of Tp.,hereinbefore described.
	Thence S.0°7'W.on a true line, bet. secs. 4 and 5.
	Over mountainous land, through scattering undergrowth.
	Distance over broken cliffs, by triangulation, as hereinbefore described.
39.32	From this point, distance by chaining. Asc.
40.16	Set an iron post, 3 ft. long, 1 in. diam., 8 ins.in the ground,with marked (x) stone, for ¼ sec.cor.;and raise a mound of stone around post, with brass cap marked

¼
S 5 | S 4
1921

Asc. 265 ft.

45.95	Ridge, brs. N.70°E. and S.70°W. Desc.480 ft.,over SW. slope.

220

BOOK 3557

32

Survey of Part of the Subdivision
of. T. 28. N., R. 13. W.

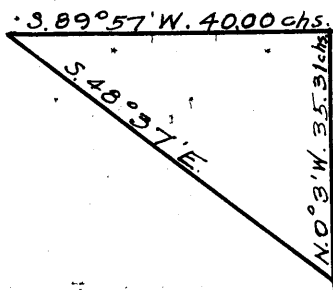| Chains	
80.16	The cor. of secs. 4, 5, 8 and 9.
	Land, mountainous.
	Soil, rocky, 4th rate.
	No timber.
	Undergrowth, sagebrush and cactus.
	From the cor.of secs.5,6,31 and 32,on the S.bdy.of Tp.,
	described in Book "H",
	N.0°3'W.bet.secs.31 and 32.
	Over rolling bench land, through dense undergrowth.
	Asc. 30 ft.
27.54	Spur, slopes NE. Desc. 20 ft.
35.54	Head of draw, course E. Asc.
40.00	Set an iron post, 3 ft. long, 1 in. diam.,10 ins.in the
	ground, with marked (x) stone, for ¼ sec.cor.;and raise a
	mound of stone around post, with brass cap marked

<div align="center">

¼

S31 | S32

1921

</div>
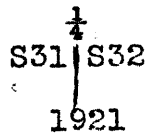
| 44.52 | South rim of Meriwhitica Canyon,brs.E.and W. Imposs- |

<div align="center">

S.89°57'W. 40.00 chs.

S.48°37'E.

N.0°3'W. 35.31 chs.

</div>

ible to chain from here. Set
a flag ahead on line, near the
point for ¼ sec.cor.,from
which I measure a base S.89°57'W
40.00 chs. From W.end of base,
flag at the 44.52 ch.point brs.
S.48°37'E. The three angles
of the triangle are therefore
48°34',41°26' and 90°,the sum
of which is 180°. The distance
triangulated is given by tan.
41°26'X40.00 = .88265 X
40.00 = 35.31 chs.,which added
to 44.52 chs.,gives

79.83	Thence N.0°3'W. 0.17 chs. to
80.00	Set an iron post, 3 ft. long, 2 ins. diam., on bed rock,
	with marked (x) stone, for cor. of secs.29,30,31 and 32;
	and raise a mound of stone around post, with brass cap
	marked
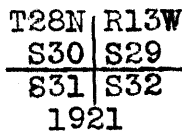
<div align="center">

T28N | R13W
S30 | S29
S31 | S32
1921

</div>

	Land, rolling and mountainous.
	Soil, rocky, 4th rate.
	No timber.
	Undergrowth, sagebrush and cactus.
	East on a random line, bet. secs. 29 and 32.
31.96	Impracticable to continue on random sec. line from this
	point. Run traverse as follows:

<div align="center">

North	.04 chs.
N.78°E.	3.40 "
N.70°E.	1.44 "
S.89½°E.	4.41 "
S.81½°W.	1.43 "
East	.37 " To a point 40.00

</div>

chs.East and 1.00 ch.N.of the true point for temp.¼
sec.cor. Set temp.witness cor.to ¼ sec.cor.

<div align="center">

From the end of course S.89½°E. 4.41 chs.,
S.83½°E. 10.41 chs.

</div>

Survey of Part of the Subdivision
of T. 28 N., R. 13 W.

Chains	
	N.72°E. 16.28 chs.
	N.79°E. 1.93 "
	S.69°E. 5.23 "
	S.53°E. 1.34 "
	S.61½°E. 5.59 " To a point 11 lks. S. of the cor. of secs. 28,29,32 and 33. The falling of the theoretical random line run East from the cor. of secs. 29, 30, 31 and 32 is
79.64	Intersect N. and S. line, 16 lks. N. of the cor. of secs. 28, 29, 32 and 33.
	Thence N.89°53'W. on a true line, bet. secs. 29 and 32.
	Over mountainous land, through scattering under growth.
	Distance by traverse, as hereinbefore described.
39.82	At a point 1.00 chs.N.0°3'W. of the true point for ¼ sec. cor., set an iron post, 3 ft. long,1 in.diam.,4 ins. in the ground, with marked(x)stone, for witness cor. to ¼ sec.cor.; and raise a mound of stone around post, with brass cap marked

$$\frac{1}{4} \frac{S29}{S32}$$
$$W\ C$$
$$1921$$

	This cor. is 6 lks. N. of foot of cliff, bearing NE. and SW.
47.68	Thence by chaining, descending 250 ft.
79.64	The cor. of secs. 29, 30, 31 and 32.
	Land, mountainous.
	Soil, rocky, 4th rate.
	No timber.
	Undergrowth, sagebrush and cactus.

	West on a random line, bet. secs. 30 and 31.
40.00	Set temp. ¼ sec.cor.
78.00	Intersect the cor. of secs. 25,30,31.and 36, on the W. bdy. of Tp.,hereinbefore described.
	Thence East on a true line, bet. secs. 30 and 31.
	Over rolling land, through scattering undergrowth.
	Desc. 100 ft.
6.50	Asc. 135 ft.
38.00	Set an iron post, 3 ft. long, 1 in.diam.,26 ins.in the ground for ¼ sec.cor.,marked on brass cap

$$\frac{1}{4} \frac{S30}{S31}$$
$$1921$$

	And raise a mound of stone, 2 ft.base, 1½ ft. high.N. of cor.
40.10	Wash, course SE. Thence along S. slope.
65.00	Wash, course NE. Asc.
78.00	The cor.of secs. 29, 30, 31 and 32.
	Land, rolling and broken.
	Soil, rocky, 4th rate; limestone formation.
	No timber.
	Undergrowth, sagebrush, cat claw, mescal, mesquite, palo verde, dogwood and cactus.

|	
	N.0°3'W.bet. secs. 29 and 30.
	Over mountainous land, through scattering undergrowth.
7.49	Set flag for triangulation. Thence across flat in bottom of canyon.
18.00	Leave flat, brs. E. and W. Asc. 370 ft.
34.05	Set an iron post, 3 ft. long, 1 in.diam.,on bed rock,

Chains	
	with marked(x)stone,for witness cor.to ¼ sec.cor.; and raise a mound of stone around post, with brass cap marked

<div align="center">

¼

.W ¦ C

S30 ¦ S29

1921
</div>

40.00	The true point for ¼ sec.cor.comes on precipitious wall, where it cannot be established.
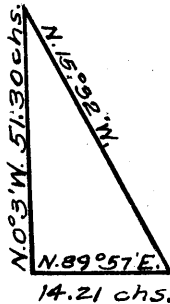
Impracticable to chain from this point. Set a flag ahead on line. From the 7.49 ch.point,measure a base N.89°57'E.14.21 chs.,from E.end of which, flag brs. N.15°32'W. The three angles of the triangle are therefore 74°31',90° and 15°29',the sum of which is 180°. The distance triangulated is given by tan, 74°31'X14.21 = 3.60996 X 14.21 =51.30 chs.,which added to 7.49 chs.,gives

58.79	Rim of canyon, 350 ft.high brs.E. and W. Continue over rolling land.
80.00	Set an iron post, 3 ft. long, 2 ins.diam.,on bed rock, with marked(x)stone, for cor. of secs. 19,20,29 and 30; and raise a mound of stone around post, with brass cap marked

<div align="center">

T28N ¦ R13W

S19 ¦ S20

S30 ¦ S29

1921
</div>

Land, mountainous and rolling.
Soil, rocky, 4th rate.
No timber.
Undergrowth, palo verde, sagebrush, dogwood,mescal, cat claw and cactus.

S.89°53'E.on a random line, bet. secs.20 and 29.

40.00	Set temp. ¼ sec.cor.,
79.84	Intersect N. and S. line, 30 lks.S. of the cor.of secs. 20, 21, 28 and 29.

Thence S.89°54'W.on a true line, bet. secs. 20 and 29.
Over mountainous land, through scattering undergrowth.
Desc. 325 ft.

39.92	Set an iron post, 3 ft. long, 1 in.diam.,on bed rock, with cross(x)at exact cor. point; for ¼ sec.cor.;and raise a mound of stone around post, with brass cap marked

<div align="center">

¼   S20

S29

1921
</div>

Continue descent, 75 ft.

42.05	Draw, course NE. Asc. 190 ft.
70.85	Spur, slopes NE. Desc. 30 ft.
79.84	The cor.of secs. 19, 20, 29 and 30.

Land, rolling, broken and mountainous.
Soil, rocky, 3rd rate.
No timber.
Undergrowth, palo verde, sagebrush, cactus, cat claw and cactus.

Chains	
	West on a random line, bet. secs. 19 and 30.
40.00	Set temp. ¼ sec. cor.
78.06	Intersect the cor. of secs. 19, 24, 25 and 30, on the W. bdy. of Tp., hereinbefore described.
	Thence East on a true line, bet. secs. 19 and 30.
	Over rolling land, through scattering undergrowth.
	Desc. 145 ft.
27.75	Draw, course SE. Asc. 100 ft.
34.80	Spur, slopes S. Desc. 50 ft.
38.06	Set an iron post, 3 ft. long, 1 in. diam., 8 ins. in the ground, with marked (x) stone for ¼ sec. cor.; and raise a mound of stone around post, with brass cap marked

$$\frac{1}{4} \underline{\text{S19}}$$
S30
1921

	Continue descent, 50 ft.
44.90	Draw, course SE. Asc. 45 ft.
59.80	Spur, slopes SE. Desc. 145 ft.
74.60	Draw, course NE. Asc. 30 ft.
78.06	The cor. of secs. 19, 20, 29 and 30.
	Land, rolling.
	Soil, rocky, 4th rate, limestone formation.
	Timber, none.
	Undergrowth, sagebrush, cactus, palo verde, dogwood, mescal and cat claw.

	N.0°3'W. bet. secs. 19 and 20.
	Over rolling and broken land, through scattering undergrowth.
	Desc. 35 ft.
5.00	Draw, course NE. Asc. 85 ft.
12.80	Spur, slopes E. Desc. 85 ft.
19.65	Draw, course SE. Asc. 240 ft.
40.00	Set an iron post, 3 ft. long, 1 in. diam., on bed rock, with cross (x) at exact cor. point, for ¼ sec. cor.; and raise a mound of stone around post, with brass cap marked

$$\frac{1}{4}$$
S19 | S20

1921

	Continue ascent, 195 ft.
65.70	Spur, slopes E. Desc. 165 ft.
79.35	Wash, course NE. Asc.
80.00	Set an iron post, 3 ft. long, 2 ins. diam., 12 ins. in the ground, with marked (x) stone, for cor. of secs. 17, 18, 19 and 20; and raise a mound of stone around post, with brass cap marked

T28N | R13W
S18 | S17
S19 | S20
1921

	Land, rolling and broken.
	Soil, rocky, 4th rate, limestone formation.
	No timber.
	Undergrowth, cactus, cat claw, sagebrush, mescal and dogwood.

|	
	N.89°54'E. on a random line, bet. secs. 17 and 20.
40.00	Set temp. ¼ sec. cor.
79.82	Intersect N. and S. line, 21 lks. N. of the true point for cor. of secs. 16, 17, 20 and 21, witnessed 9.13 chs. N. 89° 57' W., as hereinbefore described.

Chains	
	Thence N.89°57'W. on a true line, bet. secs. 17 and 20.
	Over mountainous land, through scattering undergrowth.
	Asc.
8.90	Rim of canyon, 500 ft. high, brs. N. and S.. Continue
	ascent, 260 ft.
23.80	Spur, slopes SW. Desc. 205 ft.
31.00	Draw, course SW. Asc. 70 ft.
36.60	Spur, slopes SE. Desc. 180 ft.
39.91	Set an iron post, 3 ft. long, 1 in. diam., on bed rock,
	with marked (x) stone, for ¼ sec. cor.; and raise a
	mound of stone around post, with brass cap marked

$$\frac{1}{4}\ \frac{S17}{S20}$$
1921
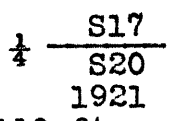
	Continue descent, 110 ft.
59.80	Draw, course SE. Asc. 70 ft.
66.80	Spur, slopes NE. Desc.
79.82	The cor. of secs. 17, 18, 19 and 20.
	Land, mountainous.
	Soil, rocky, 4th rate; limestone formation.
	Timber, none.
	Underwood, cactus, mescal, sagebrush, greasewood, dog-
	wood.

	West on a random line, bet. secs. 18 and 19.
40.00	Set temp. ¼ sec. cor.
78.06	Fall 7 lks. S. of the cor. of secs. 13, 18, 19 and 24,
	on the W. bdy. of Tp., hereinbefore described.
	Thence S.89°57'E. on a true line, bet. secs. 18 and 19.
	Over mountainous and broken land, through scattering
	undergrowth.
	Desc. 20 ft.
3.00	Draw, course NE. Asc. 180 ft.
26.15	Spur, slopes N. Desc. 85 ft.
38.06	Set an iron post, 3 ft. long, 1 in. diam., 16 ins. in the
	ground, with marked (x) stone, for ¼ sec. cor.; and raise
	a mound of stone around post, with brass cap marked

$$\frac{1}{4}\ \frac{S18}{S19}$$
1921
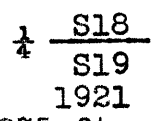
	Continue descent, 275 ft.
78.06	The cor. of secs. 17, 18, 19 and 20.
	Land, mountainous and broken.
	Soil, rocky, 4th rate.
	Timber, none.
	Undergrowth, cactus, cat claw, sagebrush, mescal and
	dogwood.

	N.0°3'W. bet. secs. 17 and 18.
	Over rolling land, through dense undergrowth.
0.50	Gulch, course N.80°E.
18.90	Leave rolling land; asc. 140 ft., over S. slope.
31.00	Spur, slopes E. Desc. 40 ft.
40.00	Set an iron post, 3 ft. long, 1 in. diam., 26 ins. in the
	ground, for ¼ sec. cor., marked on brass cap

$$\frac{1}{4}$$
S18 | S17

1921

	Continue descent, 10 ft.

Survey of Part of the Subdivision
of T. 28 N., R. 13 W.

Chains	
41.00	Draw, course E. Asc. 115 ft., over S. slope.
61.44	Spur, slopes E. Desc. 305 ft., over N. slope.
80.00	Set an iron post, 3 ft. long, 2 ins. diam., 8 ins. in the ground, with marked (X) stone, for cor. of secs. 7, 8, 17 and 18; and raise a mound of stone around post, with brass cap marked

T 28 N   R 13 W

S 7	S 8
S 18	S 17

1921

Land, rolling and mountainous.
Soil, sandy and gravelly, 2nd and 4th rates.
Timber, none.
Undergrowth, sagebrush, scrub oak, cactus.
Good grass.

It is impossible to survey the line bet. secs. 8 and 17, as the impassable rim of canyon comes at 19.52 chs. East of the cor. of secs. 7, 8, 17 and 18.

N. 89° 57' W., on a random line, bet. secs. 7 and 18.

| 40.00	Set temp. ¼ sec. cor.
77.92	Fall 7 lks. N. of the cor. of secs. 7, 12, 13 and 18, on the W. bdy. of Tp., hereinbefore described.

Thence
East, on a true line, bet. secs. 7 and 18.
Over mountainous land, through scattering undergrowth.
Desc. 50 ft.

4.00	Draw, course NE. Asc. 300 ft., over NW. slope.
35.00	Spur, slopes NE. Desc. 30 ft.
37.92	Set an iron post, 3 ft. long, 1 in. diam., 8 ins. in the ground, with marked (X) stone, for ¼ sec. cor.; and raise a mound of stone around post, with brass cap, marked

¼	S 7
S 18

1921

Continue descent, 255 ft.

59.00	Draw, course N. 3° E. Asc. 215 ft.
66.60	Spur, slopes NE. Desc. 345 ft.
77.00	Draw, course N. 3° E. Asc. 30 ft.
77.92	The cor. of secs. 7, 8, 17 and 18.

Land, mountainous.
Soil, sandy, gravelly and rocky, 2nd to 4th rates.
Timber, none.
Undergrowth, sagebrush, cactus.
Fair grass in spots.

N. 0° 3' W., bet. secs. 7 and 8.
Over mountainous land, through dense undergrowth.

0.35	Draw, course NE. Asc. 105 ft.
9.54	Spur, slopes E. Desc. 25 ft.
12.54	Draw, course E. Asc. 50 ft.
15.57	Rim of small canyon, brs. E. and W., 350 ft. deep. Impracticable to chain across. Set flag ahead on line from which I measure a base N. 89° 57' E., 10.00 chs. From E. end of base, flag at 15.57 ch. point brs. S. 31° 33' W. The three angles of the triangle are— therefore 31° 36', 90° and 58° 24'

N.89°57'E.
10.00 chs.
N.0°3'W 16.25chs
S.31°33'W
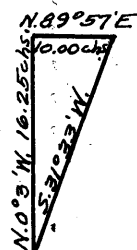
Survey of Part of the Subdivision
of T. 28 N., R. 13 W.

Chains	
	the sum of which is 180°. The distance triangulated is given by tan. 58° 24' X 10.00 = 1.62548 X 10.00 = 16.25 chs., which added to 15.57 chs., gives
31.82	North rim of canyon, brs. E. and W. Asc. 50 ft.
40.00	Set an iron post, 3 ft. long, 1 in. diam., on bed rock, with cross (X) at exact cor. point, for ¼ sec. cor.; and raise a mound of stone around post, with brass cap marked

$$\frac{1}{4}$$
$$\text{S 7} \mid \text{S 8}$$
1921

	Continue ascent, 105 ft.
55.54	Spur, slopes W. Desc.
55.96	Rim of canyon, brs. N. 8° E., and S. 8° W. Impossible to continue on line from this point. Run traverse as follows:

N. 24¼° E.,	10.70 chs.	
N. 13¾° E.,	13.00 "	
North	1.67 "	
West	5.11 "	To a point

2.44 chs. East of the true point for cor. of secs. 5, 6, 7 and 8, where I

Set an iron post, 3 ft. long, 2 ins. diam., on bed rock, with cross (X) at exact cor. point, for witness cor. to cor. of secs. 5, 6, 7 and 8; and raise a mound of stone around post, with brass cap marked

T 28 N R 13 W
$$\text{W C} \quad \frac{\text{S 6} \mid \text{S 5}}{\text{S 7} \mid \text{S 8}}$$
1921

Cor. stands on rim of canyon, brs. N. 15° E., and S. 15° W.
Land, mountainous.
Soil, rocky and gravelly, 4th rate.
Timber, none.
Undergrowth, sagebrush, dogwood and cactus.
Poor growth of grass.

	As the true point for cor. of secs. 5, 6, 7 and 8 is inaccessible
	East on a random line, from the witness cor. to cor. of secs. 5, 6, 7 and 8
40.00	(From true point). Set temp. ¼ sec. cor.
79.88	Intersect N. and S. line, 15 lks. S. of the cor. of secs. 4, 5, 8 and 9.
	Thence
	S. 89° 54' W. on a true line, bet. secs. 5 and 8.
	Over mountainous land, through scattering undergrowth
	Asc. 190 ft.
11.90	Spur, slopes SE. Desc. 200 ft.
16.90	Draw, course SE. Asc. 255 ft.
34.90	Spur, slopes SE. Desc. 90 ft.
39.94	Set an iron post, 3 ft. long, 1 in. diam., 26 ins. in the ground, for ¼ sec. cor., marked on brass cap

$$\frac{1}{4} \frac{\text{S 5}}{\text{S 8}}$$
1921

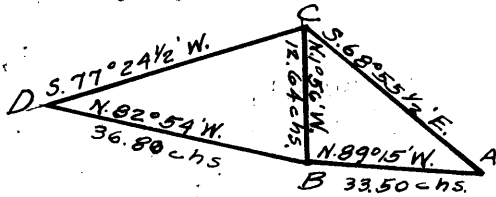|	
	Continue descent.
42.00	Draw, course S. Asc.
43.00	Desc. 65 ft.
59.90	Draw, course SE. Asc. 115 ft., over E. slope.
67.90	Spur, slopes S. Thence along S. slope.
74.90	Spur, slopes SW. Desc. 130 ft.
77.44	(Witness cor. to cor. of secs. 5, 6, 7 and 8.)
79.88	The true point for cor. of secs. 5, 6, 7 and 8.
	Land, mountainous.

Survey of Part of the Subdivision
of T. 28 N., R. 13 W.

Chains	
	Soil, rocky, 4th rate. No timber. Undergrowth, sagebrush, greasewood and cactus. Fair grass.

In order to survey the line bet. secs. 6 and 7, I proceed as follows: Set a flag 0.20 chs. North of the witness cor. of secs. 5, 6, 7 and 8. From this flag, "A", set flag "B" on a bearing N.89°15'W. From "B" measure a base N.1°56'W. 12.64 chs. to point "C", from which flag "A" brs. S.68°55½'E. The three angles of the triangle are therefore 20°19½', 92°41' and 66°59½', the sum of which is 180°. The distance triangulated on the bearing N.89°15'W.is given by the sine proportion::

$$\frac{X}{12.64} = \frac{\sin. 66°59½'}{\sin. 20°19½'}$$

log. 12.64	=	1.101747
log.sin. 20°19½'	=	9.540761
		1.560986
log.sin. 66°59½'	=	9.963999
log.X	=	1.524985
X	=	33.50 chs.

Thence West 8.94 chs. and South 0.64 chs.to

| 40.00 | Set temp. ¼ sec.cor. |

From "C", flag "D" brs. S.77°24½'W.. From "B", "D" brs. N.82°54'W. The three angles of the triangle are 19°41½', 79°20½' and 80°58', the sum of which is 180°. The distance triangulated on the bearing N.82°54'W. is given by the sine proporation:

$$\frac{X}{12.64} = \frac{\sin. 79°20½'}{\sin. 19°41½'}$$

log. 12.64	=	1.101747
log.sin. 19°41½'	=	9.527577
		9.574170
log.sin. 79°20½'	=	9.992442
log. X	=	1.566612
X	=	36.85

From "D", West 10.45 chs. and South 5.00 chs.to the cor. of secs. 1, 6,7 and 12, on the W. bdy.of Tp., hereinbefore described.

The length and falling of the theoretical random from true point for cor. of secs. 5,6,7 and 8 West to the boundary are 78.09 chs.,fall 20 lks. South..

From the cor. of secs. 1, 6, 7, and 12. S.89°51'E.on a true line, distance by triangulation.

Over mountainous land, through scattering undergrowth..

| 38.09 | Set an iron post, 3 ft.long,1 in.diam.,on bed rock,with cross (X) at exact cor.point,for ¼ sec.cor.;and raise a mound of stone around post, with brass cap marked |

$$\frac{1}{4} \begin{array}{|c|} \hline S \quad 6 \\ \hline S \quad 7 \\ \hline \end{array}$$

1921

Thence East, distance by chaining.

| 47.03 | Thence North 0.54 chs. to flag "B",which is 1500 ft. below flag "D" and 1400 ft. below flag "A". |

Thence by triangulation.

| 78.09 | The true point for cor.of secs. 5,6,7 and 8. |

Chains	
	Land, mountainous. Soil, rocky, 4th rate. Timber, none. Undergrowth, sagebrush and cactus.

In order to determine the length and bearing of the line
bet. secs. 5 and 6, I proceed as follows:
From a point 0.51 chs. South and 0.26 chs. East of the
witness cor. to cor. of secs. 5, 6, 7 and 8, flag on
the traverse of the North Boundary of TP. at the West
end of course N.82oW., 34.14 chs. brs. N.27o21'W. and
flag at the East end of course brs. N.5o34'W. The
three angles of the triangle
are therefore 21o47', 54o39' and
103o34', the sum of which is
180o. The distance to E. end
of course is given by the sine
proportion:
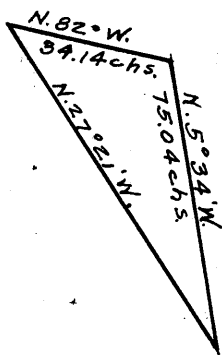
$$\frac{X}{34.14} = \frac{\sin.54o39'}{\sin.21o47'}$$

|	
log. 34.14	= 1.533264
log.sin.21o47'	= 9.569488
	1.963776
log.sin.54o39'	= 9.911495
log.X	= 1.875271
X	75.04

From this point, the traverse to the true point for cor.
of secs. 5, 6, 31 and 32 is as follows:
East 4.16 chs.
North 0.99 chs.
N.0o15'W. 5.04 chs.
The course and length of the line joining the true point
for cor. of secs. 5,6,31 and 32 with the true point for
cor. of secs. 5,6,7 and 8 is S.0o15'E. 80.20 chs.
From the true point for cor. of secs. 5,6,31 and 32,
witnessed 5.04 chs. S.0o15'E. as hereinbefore described,
S.0o15'E. on a true line, bet. secs. 5 and 6.
Over mountainous land, through scattering undergrowth.
The witness cor. to cor. of secs. 5,6,31 and 32.
Impracticable to chain from this point. Set a flag ahead
on line; from which I measure a
base N.89o45'E. 12.07 chs., from
the E. end of which, flag at the
witness cor. brs. N.25o45'W. The
three angles of the triangle are
therefore 90o, 25o30' and 64o30',
the sum of which is 180o. The
distance triangulated is given
by tan.64o30'X12.07 = 2.09654 X
12.07 = 25.31 chs., which added
to 5.04 chs., gives

5.04	
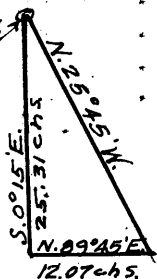
30.35	Triangulation point in wash, course E.
31.15	Right bank of wash, brs. E. and W. Asc. 245 ft.
40.20	Set an iron post, 3 ft. long, 1 in. diam., on bed rock, with cross (X) at exact cor. point, for ¼ sec. cor.; and raise a mound of stone around post, with brass cap marked

$$\frac{1}{4}$$
S 6 | S 5

1921

Cor. is on N. side of large limestone rock.

Survey of Part of the Subdivision of T. 28 N., R. 13 W.

Chains.	
80.20	Thence by triangulation, as hereinbefore described. The true point for cor. of secs. 5, 6, 7 and 8. Land, mountainous. Soil, rocky, 4th rate; limestone formation. No timber. Undergrowth, sagebrush, mesquite, cactus, ocotillo, cat claw and palo verde.

Boundaries of that Part of T. 28 N., R. 13 W.

Surveyed under This Group.

Latitudes, departures and closing errors.

Line designated.	True bearing.	Dist. chs.	Latitudes N. chs.	Latitudes S. chs.	Departures E. chs.	Departures W. chs.
South Boundary.	West	478.34				478.34
West Boundary	North	480.00	480.00			
North Boundary	East	157.82			157.82	
Subdivisional Boundary.	S.0° 7' W.	80.16		80.16		.16
	S.0° 3' E.	160.00		160.00	.14	
	N.89°53'E.	79.76	.16		79.76	
	N.89°59'E.	80.02	.02		80.02	
	S.0° 1'E.	160.00		160.00	.05	
	S.89°56'E.	80.10		.09	80.10	
	N.0° 1'W.	80.00	80.00			.02
	N.89°45'E.	79.74	.35		79.74	
East Boundary	South	160.00		160.00		
Convergency					.30	
Totals			560.53 / 560.25	560.25	477.86	478.52 / 477.86
Error in latitude			.28			
Error in departure						.65

Final Field Test of Instrument No. 9223.

June 19, 1921: at our camp, near the NE. cor. of sec. 30, T. 27 N., R. 13 W., G. and S. R. B. and M., lat. 35°42½'N, long. 113°42½'W., using the meridian determined as described in Book "H", at 9 hrs. 0 M., a.m., l.m.t., set off 35°42½'N. on the lat. arc; 23°26'N. on the decl. arc; and determine a meridian with the solar which agrees with the true meridian. I therefore conclude that the transit and solar have been in satisfactory adjustment during the progress of this survey.

General Description.

This township is exceedingly rugged, broken and difficult to survey, being traversed by Spencer Canyon, which runs northward through the eastern part of the township, and Meriwhitica Canyon, which enters the township in sec. 31, and runs northeasterly to its confluence with Spencer Canyon. Both canyons, with their almost perpendicular, impassable walls, many hundreds of feet deep, form fitting tributaries to the mighty Colorado, into which they empty in sec. 11. The Grand Canyon of the Colorado renders the northeast corner of the township unsurveyable.

The soil is principally rocky, 4th rate in quality.
There is no timber. Sagebrush, palo verde, cat claw,
mescal, dogwood and cactus are abundant. Water is found
in the bottom of canyons only. No evidences of mineral
were noted. An Indian village is located in sec. 28.

4—680

FIELD ASSISTANTS. to

Glenn F. Sawyer, U. S. Transitman

NAMES.	CAPACITY.
J. S. Dameron	1st Chainman.
Max Dessau	1st and 2nd Chainman.
Ed. F. Stanley	2nd Chainman
Geoffrey Brewer	2nd Chainman
Hugh Bowers	Axeman
Dan M. Thompson	Flagman and Cornerman

CERTIFICATE OF UNITED STATES TRANSITMAN.

I, __Glenn F. Sawyer, U. S. Transitman__, , hereby certify upon honor that, in pursuance

of special instructions received from the U. S. Surveyor General, for __Group 109, Arizona,__

bearing date of the ____26th____ day of __February__, 19 20, I have well, faithfully, and truly

in my own proper person, and in strict conformity with said instructions, the Manual of Surveying Instruc-

tions, and the laws of the United States, surveyed all those parts or portions of __the__

__West Boundary and__

__Subdivision Lines of__

__TOWNSHIP 28 NORTH, RANGE 13 WEST__

_____ of the __Gila and Salt__

__River Base and__ Meridian, in the State of _____Arizona_____, which are represented in

and by diagram on page 1 hereof

the foregoing field notes as having been executed by me, and under my direction; and that all the corners of

said survey have been established and perpetuated in strict accordance with the Manual of Surveying Instruc-

tions, and the special written instructions of the U. S. Surveyor General, for __Group 109, Arizona,__

and in the specific manner described in the field notes, and that the foregoing are the original field notes of

such survey.

Place _Animas New Mexico_ _____ _Glenn F. Sawyer_
U. S. Transitman

Date _April 16 1923_

~~APPROVAL.~~

4—680

FIELD ASSISTANTS. to

Dupree R. Averill, U. S. Surveyor.

NAMES.	CAPACITY.
Frank G. Smith	2nd Chainman
Chas. S. Rye	Flagman
Wm. T. Keplinger	Flagman
Chas. Worden	Axeman
W. H. Harmon	Cornerman
Henry McKelvey	Cornerman

6—2764

BOOK 3557

CERTIFICATE OF UNITED STATES SURVEYOR.

I, Dupree R. Averill, U. S. Surveyor, hereby certify upon honor that, in pursuance of special instructions received from the U. S. Surveyor General, for Group 109, Arizona, bearing date of the 26th day of February, 1920, I have well, faithfully, and truly in my own proper person, and in strict conformity with said instructions, the Manual of Surveying Instructions, and the laws of the United States, surveyed all those parts or portions of the

West and North Boundaries

and

Subdivision Lines of

TOWNSHIP 28 NORTH, RANGE 13 WEST

of the Gila and Salt River Base and Meridian, in the State of Arizona, which are represented in the foregoing field notes and by diagram on page 1 hereof as having been executed by me, and under my direction; and 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 U. S. Surveyor General, for Group 109, Arizona, and in the specific manner described in the field notes, and that the foregoing are the original field notes of such survey.

Place *Needles Calif.*,

Date *April 9, 1923*

Dupree R. Averill
U. S. Surveyor.

APPROVAL.

OFFICE OF THE UNITED STATES SURVEYOR GENERAL,

Phoenix, Arizona MAY 24 1923, 1923.

The foregoing field notes of the survey of

Part of the North Boundary,

The West Boundary, and

Part of the Subdivision lines of

TOWNSHIP 28 NORTH, RANGE 13 WEST,

of the Gila and Salt River Base and Meridian, in the State of Arizona,

executed by Glenn F. Sawyer, U. S. Transitman, and Dupree R. Averill, U. S. Surveyor,
under his special instructions dated Feb. 26, 1920, for Gr. 109, Arizona,, having been critically examined, and the necessary corrections and explanations made, the said field notes, and the surveys they describe, are hereby approved.

U. S. 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.

U. S. Surveyor General.