

W30

45

FIELD BOOK

400

H. S. CROCKER COMPANY

DRAWING MATERIALS AND
SURVEYING INSTRUMENTS

SAN FRANCISCO

TABLES FOR EXCAVATIONS AND EMBANKMENTS

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING

Roadway 18 Feet Wide. Side Slopes 1 to 1.
For Single Track Excavation.

"Copyright, 1895, by Kueffel & Esser Co."

	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	9.0	9.1	9.2	9.3	9.4	9.5	9.6	9.7	9.8	9.9	0
1	10.0	10.1	10.2	10.3	10.4	10.5	10.6	10.7	10.8	10.9	1
2	11.0	11.1	11.2	11.3	11.4	11.5	11.6	11.7	11.8	11.9	2
3	12.0	12.1	12.2	12.3	12.4	12.5	12.6	12.7	12.8	12.9	3
4	13.0	13.1	13.2	13.3	13.4	13.5	13.6	13.7	13.8	13.9	4
5	14.0	14.1	14.2	14.3	14.4	14.5	14.6	14.7	14.8	14.9	5
6	15.0	15.1	15.2	15.3	15.4	15.5	15.6	15.7	15.8	15.9	6
7	16.0	16.1	16.2	16.3	16.4	16.5	16.6	16.7	16.8	16.9	7
8	17.0	17.1	17.2	17.3	17.4	17.5	17.6	17.7	17.8	17.9	8
9	18.0	18.1	18.2	18.3	18.4	18.5	18.6	18.7	18.8	18.9	9
10	19.0	19.1	19.2	19.3	19.4	19.5	19.6	19.7	19.8	19.9	10
11	20.0	20.1	20.2	20.3	20.4	20.5	20.6	20.7	20.8	20.9	11
12	21.0	21.1	21.2	21.3	21.4	21.5	21.6	21.7	21.8	21.9	12
13	22.0	22.1	22.2	22.3	22.4	22.5	22.6	22.7	22.8	22.9	13
14	23.0	23.1	23.2	23.3	23.4	23.5	23.6	23.7	23.8	23.9	14
15	24.0	24.1	24.2	24.3	24.4	24.5	24.6	24.7	24.8	24.9	15
16	25.0	25.1	25.2	25.3	25.4	25.5	25.6	25.7	25.8	25.9	16
17	26.0	26.1	26.2	26.3	26.4	26.5	26.6	26.7	26.8	26.9	17
18	27.0	27.1	27.2	27.3	27.4	27.5	27.6	27.7	27.8	27.9	18
19	28.0	28.1	28.2	28.3	28.4	28.5	28.6	28.7	28.8	28.9	19
20	29.0	29.1	29.2	29.3	29.4	29.5	29.6	29.7	29.8	29.9	20
21	30.0	30.1	30.2	30.3	30.4	30.5	30.6	30.7	30.8	30.9	21
22	31.0	31.1	31.2	31.3	31.4	31.5	31.6	31.7	31.8	31.9	22
23	32.0	32.1	32.2	32.3	32.4	32.5	32.6	32.7	32.8	32.9	23
24	33.0	33.1	33.2	33.3	33.4	33.5	33.6	33.7	33.8	33.9	24
25	34.0	34.1	34.2	34.3	34.4	34.5	34.6	34.7	34.8	34.9	25
26	35.0	35.1	35.2	35.3	35.4	35.5	35.6	35.7	35.8	35.9	26
27	36.0	36.1	36.2	36.3	36.4	36.5	36.6	36.7	36.8	36.9	27
28	37.0	37.1	37.2	37.3	37.4	37.5	37.6	37.7	37.8	37.9	28
29	38.0	38.1	38.2	38.3	38.4	38.5	38.6	38.7	38.8	38.9	29
30	39.0	39.1	39.2	39.3	39.4	39.5	39.6	39.7	39.8	39.9	30
31	40.0	40.1	40.2	40.3	40.4	40.5	40.6	40.7	40.8	40.9	31
32	41.0	41.1	41.2	41.3	41.4	41.5	41.6	41.7	41.8	41.9	32
33	42.0	42.1	42.2	42.3	42.4	42.5	42.6	42.7	42.8	42.9	33
34	43.0	43.1	43.2	43.3	43.4	43.5	43.6	43.7	43.8	43.9	34
35	44.0	44.1	44.2	44.3	44.4	44.5	44.6	44.7	44.8	44.9	35
36	45.0	45.1	45.2	45.3	45.4	45.5	45.6	45.7	45.8	45.9	36

Calculated by Julien A. Hall, M. Am. Soc. C. E.

Out run Conduct.
L. M. P.

FROM
LORING'S BOOK STORE
SAN DIEGO, CAL.

Index

Bench & Ditch Grades	1
Abandoned Location Hubs	2-5
Grade Hubs 263+50-249	21-25
Grade Hubs 356 + 363+86	26-28
" " 355+50-282+13	29-49
" " 212 to Entrance #2	50-51
" " Exit #2 - " #3	51-53

0
1
2
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21
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26
27
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29
30
31
32
33
34
35
36

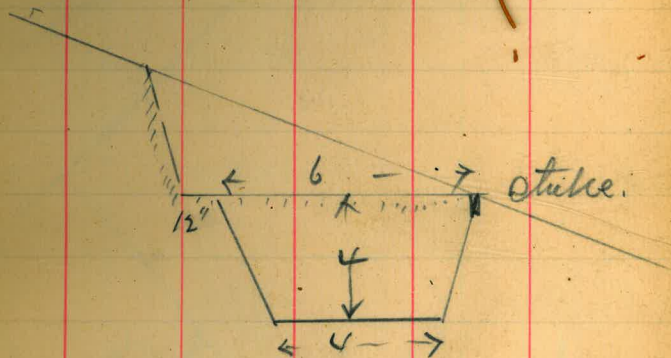
MICROFILMED

N End No. 4. Bottom 1481.52
 Sta. 265+20± Bench 1485.52

356-

Bott 1474.16
 Bench 1478.16

Grade & End Survey Tunnel 1502
 192 + 08 15.36
 old Sta 200 - (from 190) 1486.64



Set stakes for ditch Bench
 + 4' above grade

thus above point 1486.64
 1490.64

then $\frac{.04}{100}$ for each 50'

Location Nubs - Ditch Section - Delgada conduit

Grade (+4.0')

= BM 32 (5' 9" 212' 40)

(1/2 day - P.M.)

7-15-'07.

N.L. Hall
 R. Wulst
 P. W. ...
 D. la Rue
 C. ...
 2 Mexicans

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36

5.77 1507.63 1506.86

11.57 1496.06

1.30 1497.26

5.59 1491.77

0.85 1492.62

209 +50

3.30

1489.24

209

3.30

1489.28

208 +50

3.30

1489.32

208

3.26

~~Abandoned~~

207 +50

3.22

1489.40

5.77 1495.17

3.22 1489.40

8.69

20.38

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36

3.

1495.17

207

573

206 +50

569

206

565

205 +50

561

205

557

0

5.57 1489.60

6.41 1496.01

204 +50

637

204

633

203 +50

629

641

557

Grade (+4.0)

1489.44

1489.48

1489.52

1489.56

1489.60

1489.64

1489.68

1489.72

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35

4.

203

202 +50

202

0

201 +50

201

200 +50

200

199 +50

149601

662 149646

662

6.17

6.17 148984

620

621

617

658

654

650

646

642

Grade (+45)

148976

148980

148986

148988

148992

148996

149000

149004

5.

199

1496.46

196 + 50

195

197 + 50

0

197

63

634

630

62

626 1490.20

630 1497.12

689

9 miles (+ 4.0)

1490.08

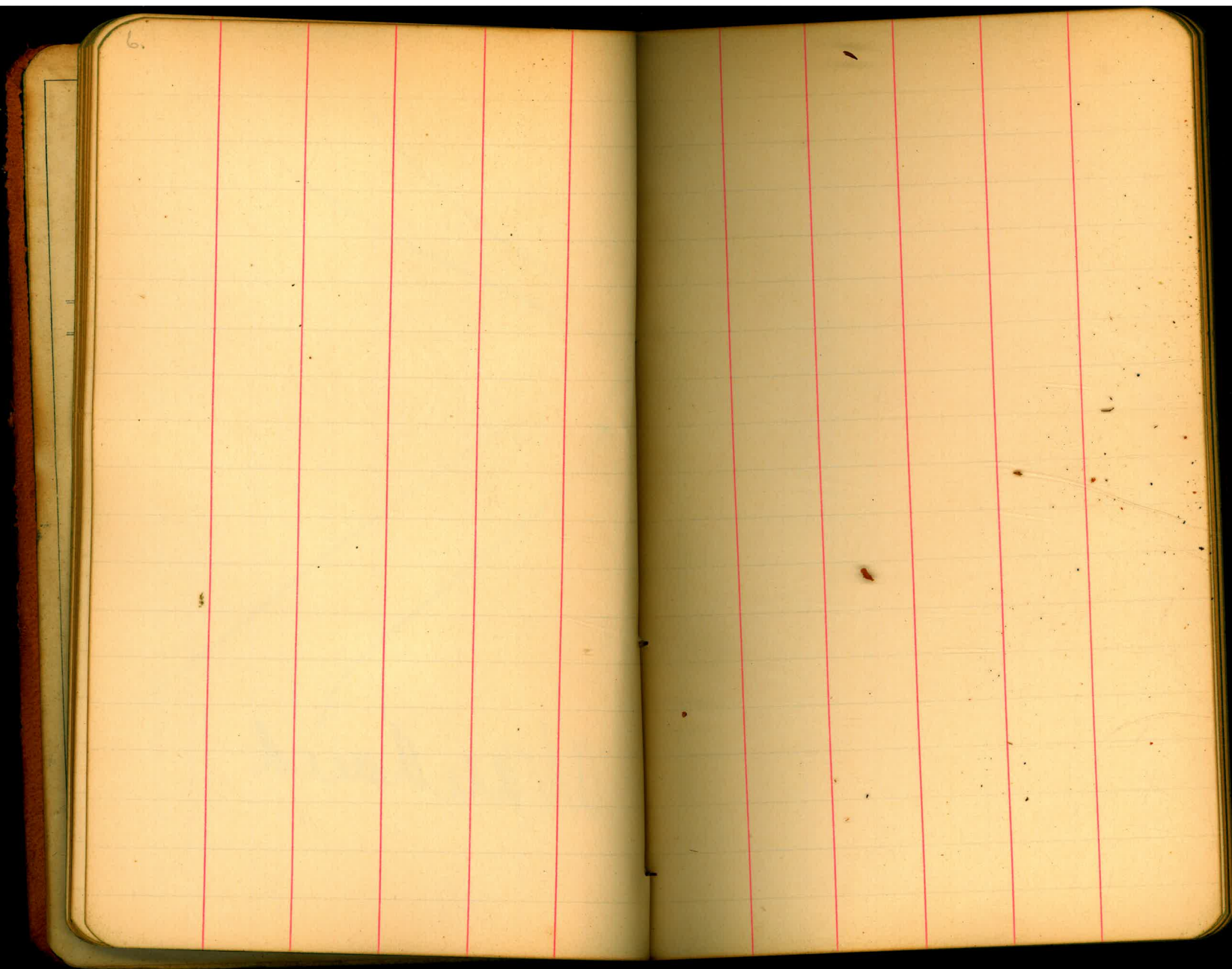
1490.12

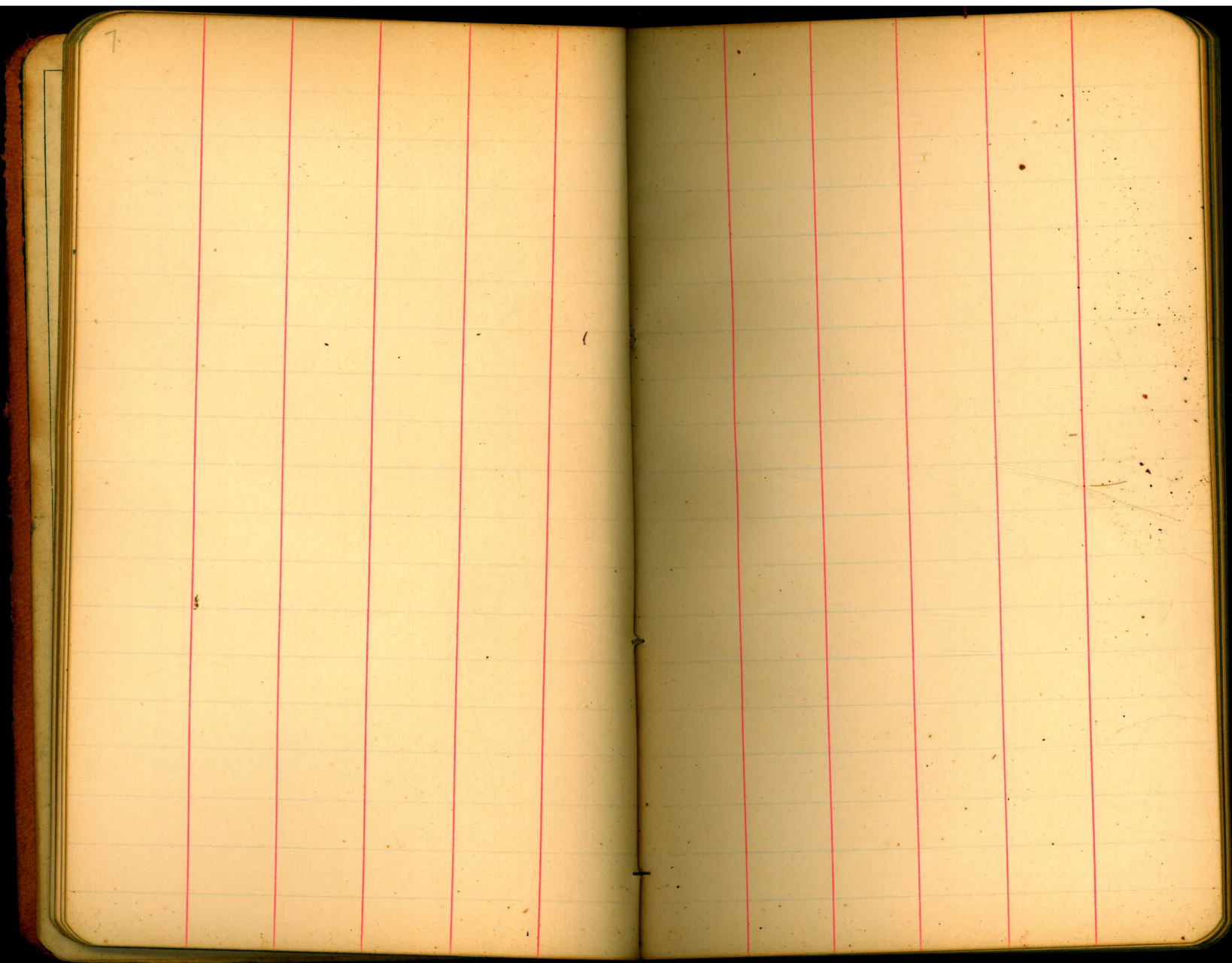
1490.16

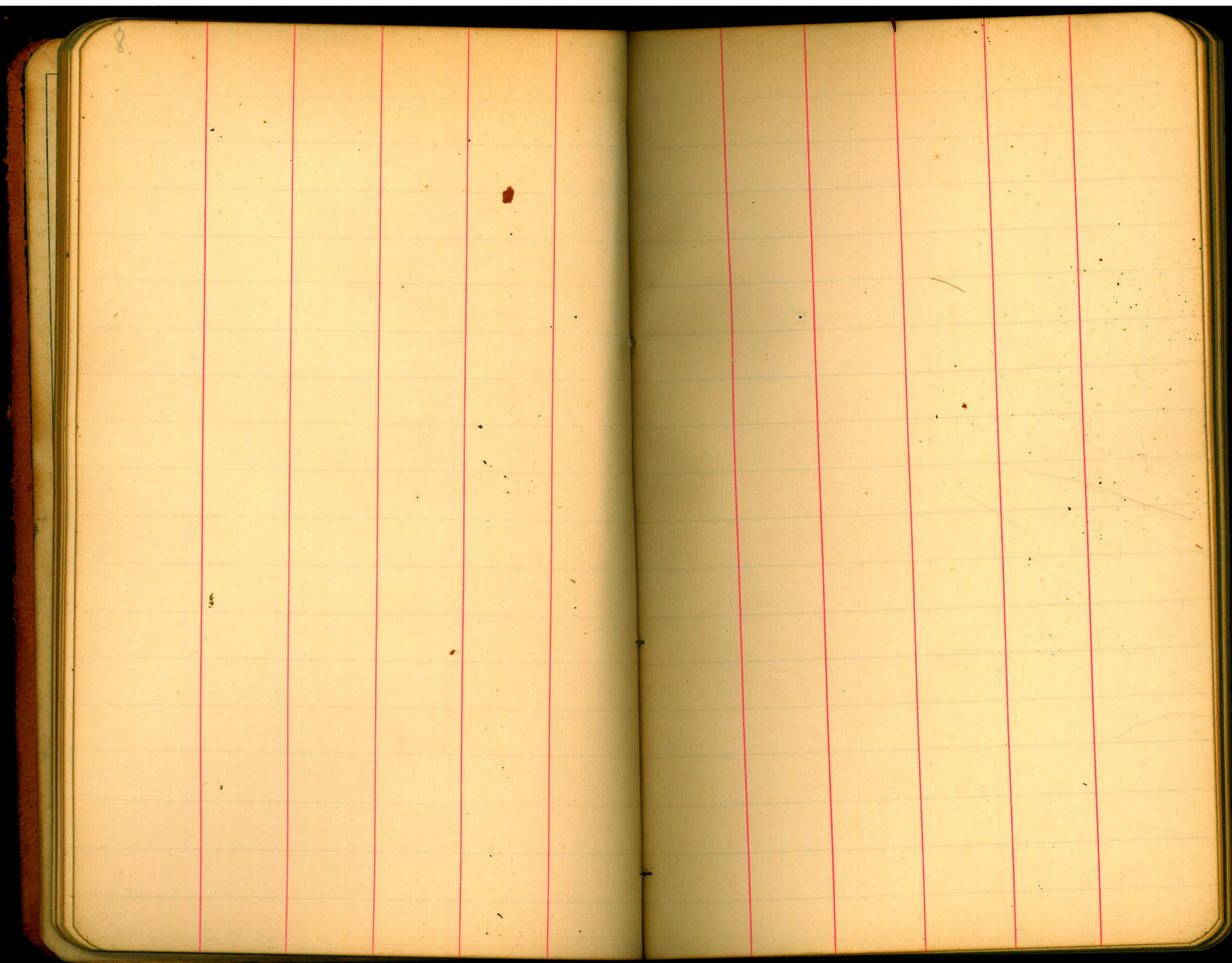
1490.20

1490.24

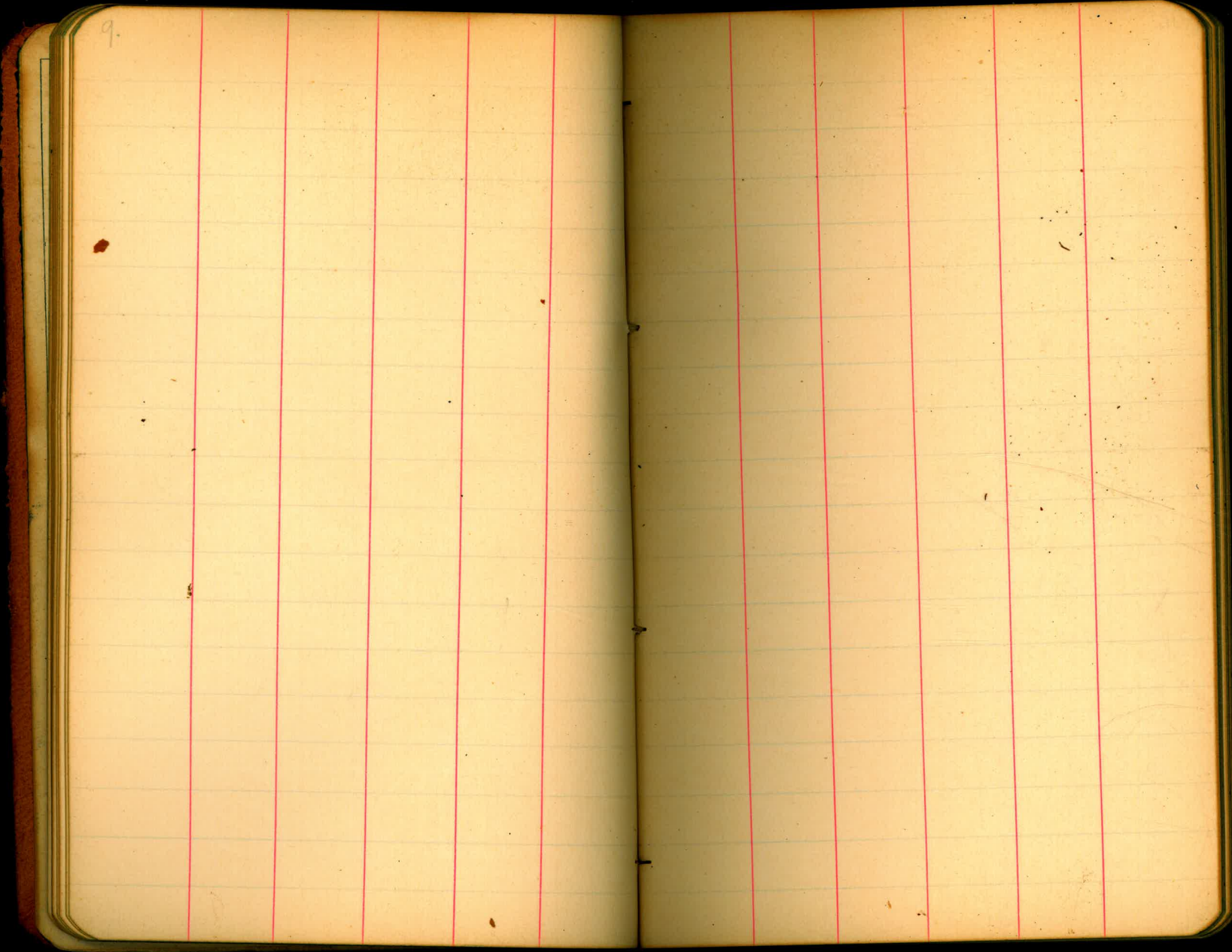
Abandoned

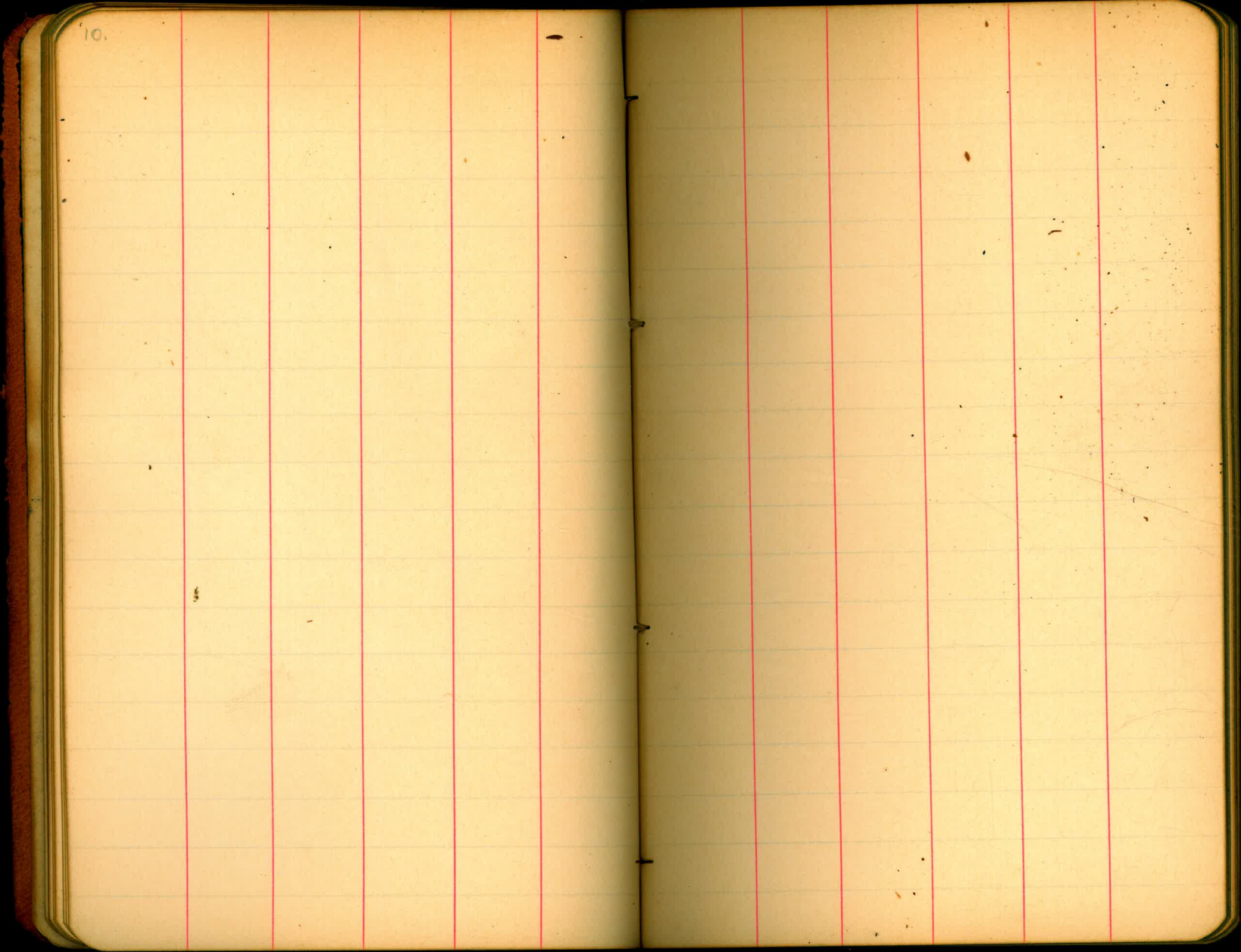


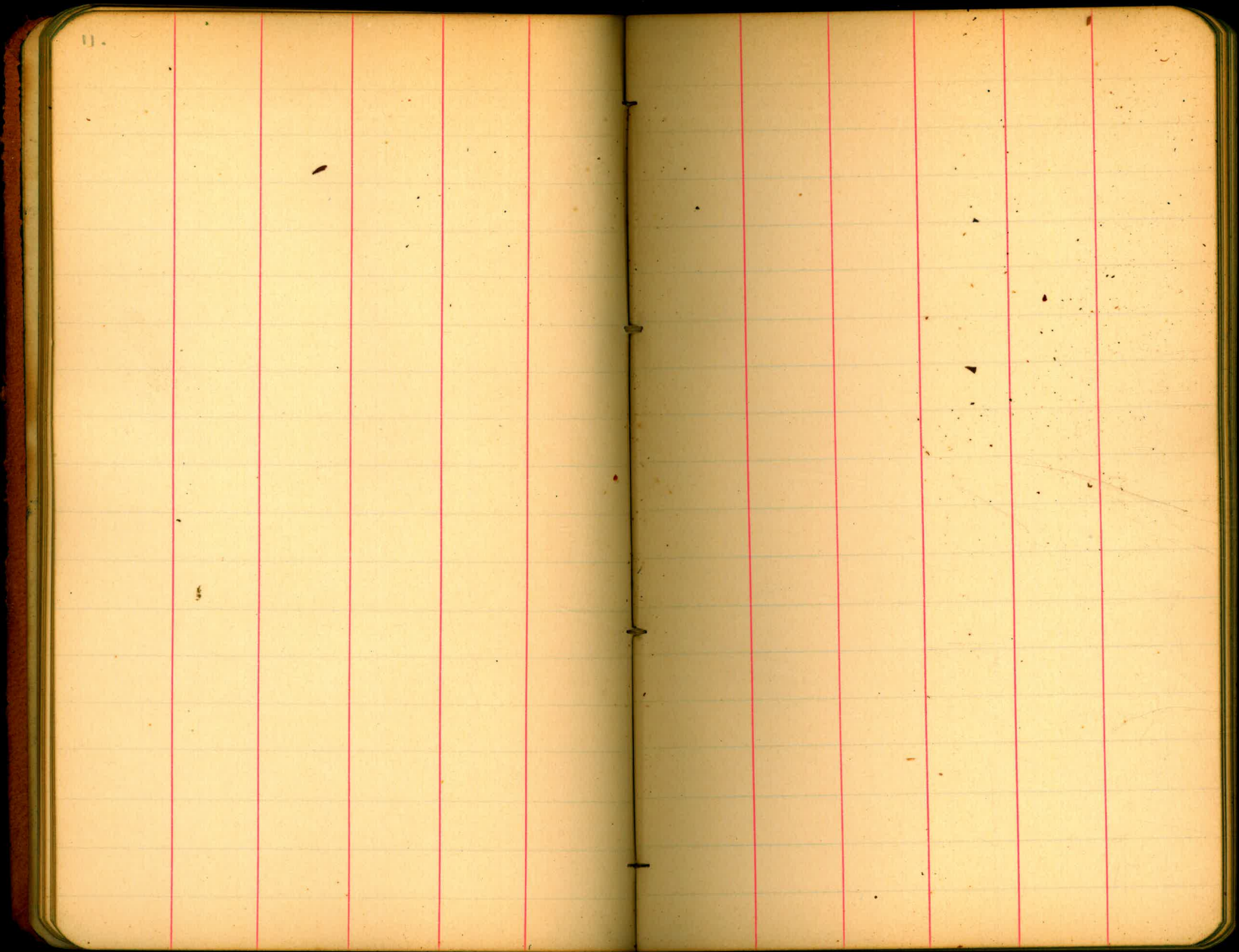




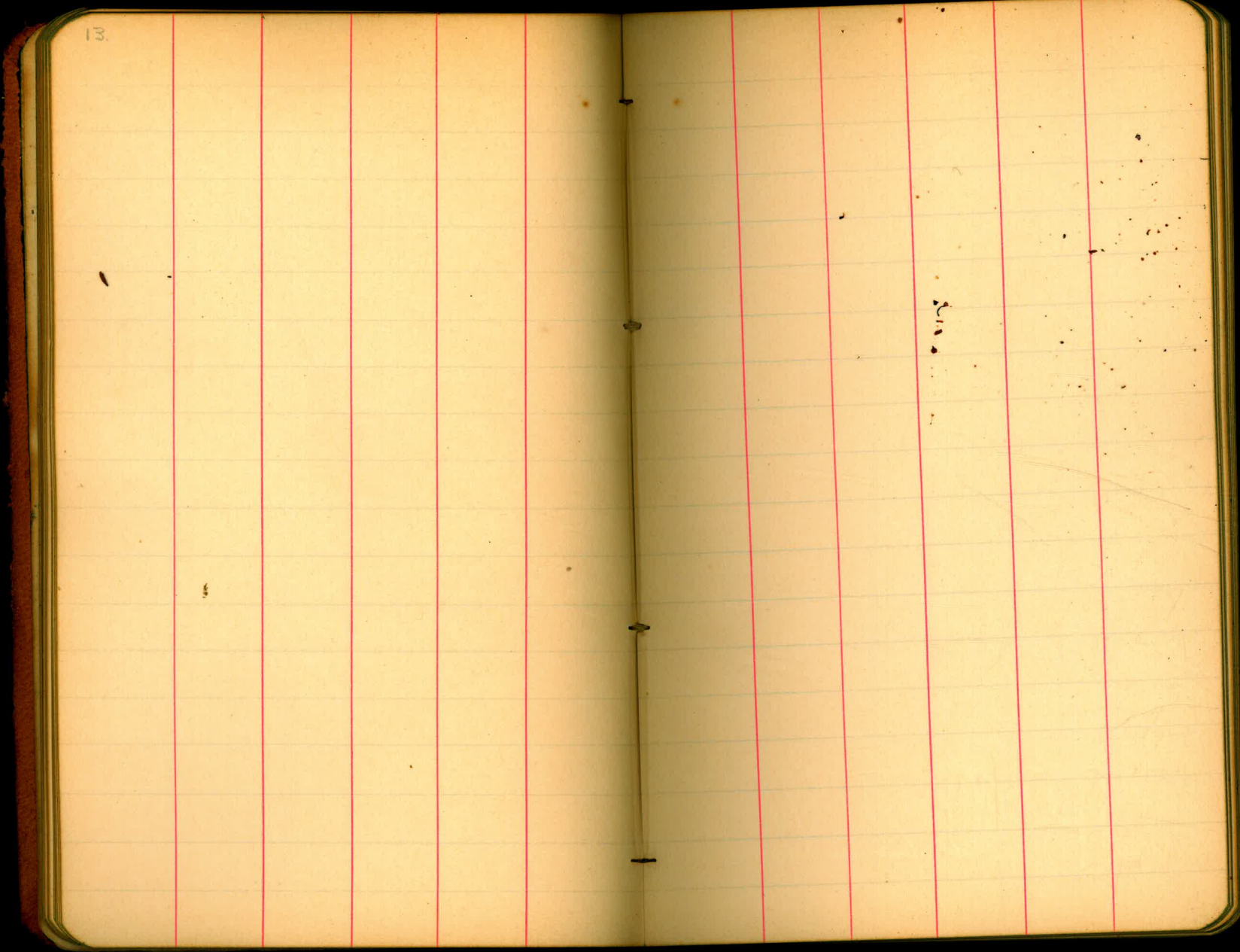
9.

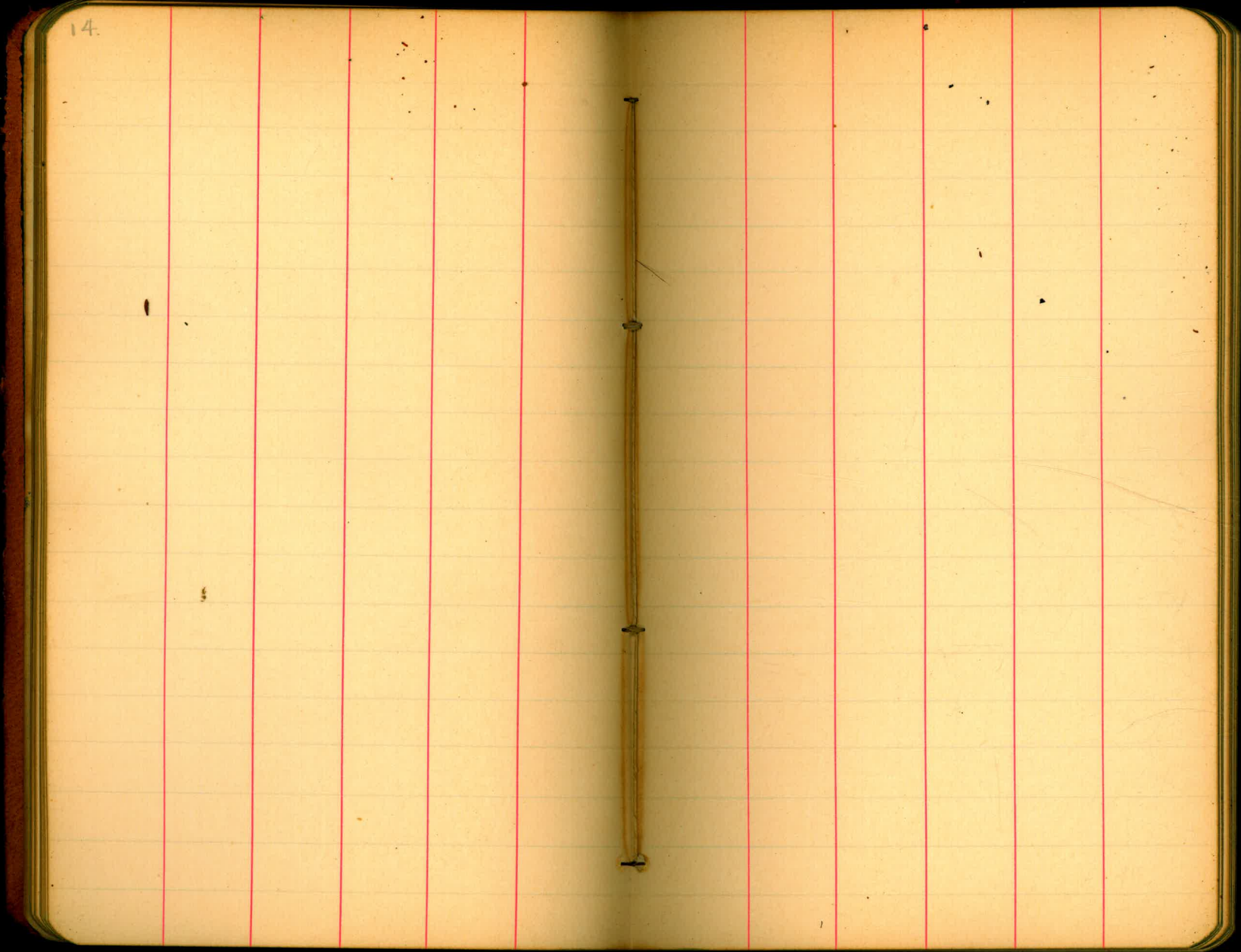


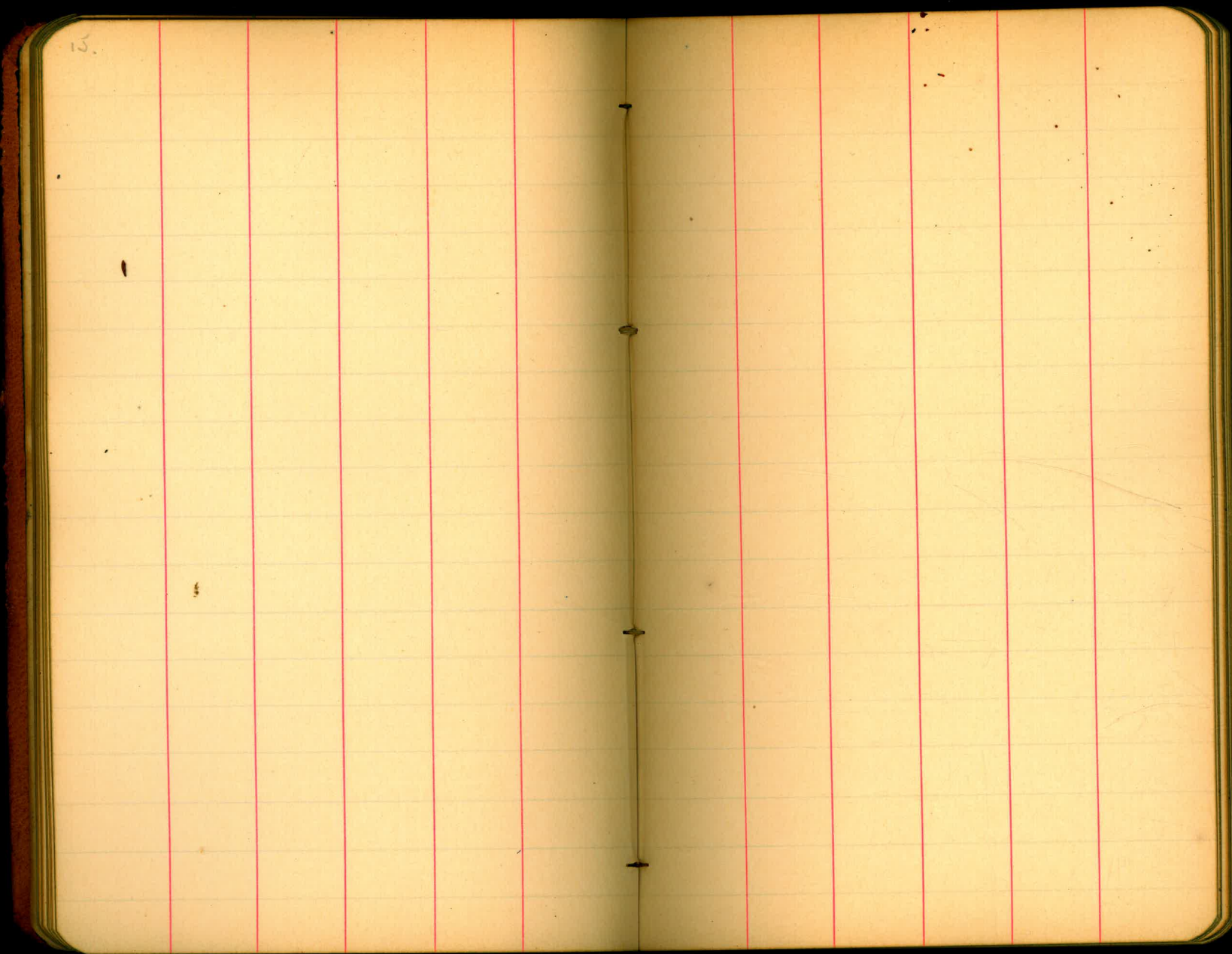




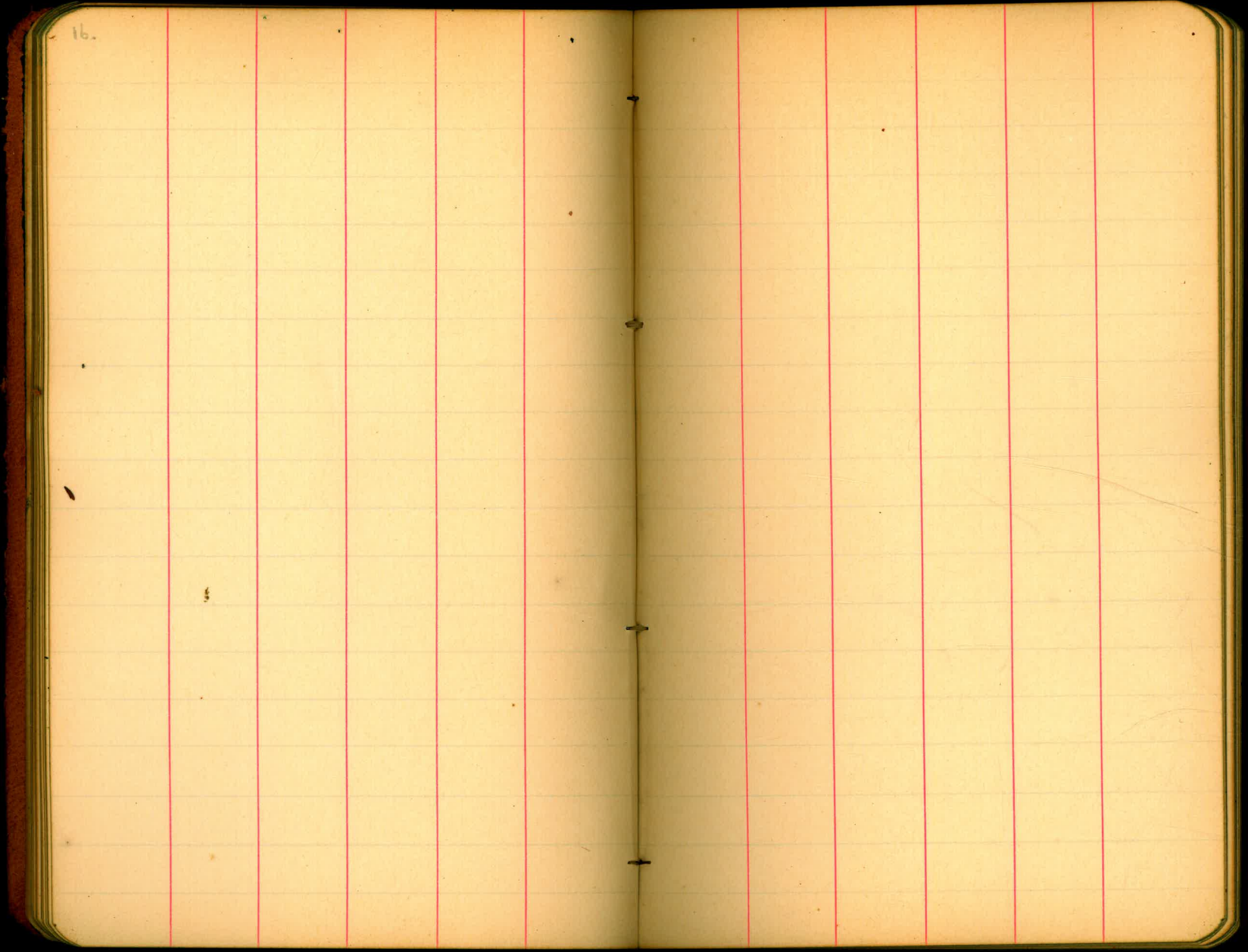
11.







15.



17.

18.

19.

20.

21.	Location	Stubs	Ditch	Section
	0.17	1505.65		1505.49
o			832	1497.33
	0.66	1497.99		
o			12.38	1493.6
	5.41	1491.02		
262+50				6.10
263				6.06
262+50				6.02
262				5.98
o			599	1485.03
	520	1490.23		
261+50				5.15
260+96				5.11
	11.44		2669	

Dulzura conchir.
- 37m 37

Grade (+4.0)

7-17-07

Mr. Hall
F. W. West
H. W. Watson
Don La Rue
Cassius Lark
Greek laborer

1486.92

1484.96

1485.00

1483.04

1485.08

1483.12

note: Flame

fr. 261+50 to 260.

221					
		1490.23			Grade (+40')
260 + 51				5.07	1485.16
0			6475	1483.755	
	9.26	1493.015			
260				7.82	1485.20
259 + 50				7.78	1485.24
259				7.74	1485.28
258 + 60				7.70	1485.31
258				7.66	1485.36
0			906	1483.955	
	9.375	1493.330			
257 + 50				7.93	1485.40
	11.635		11.535		

= Point pathol no. in gals

23.

1493.33

Grade (+4.0')

1485.44

257 +10

7.89

256 +50

7.85

85.48

256

7.8

85.52

255 +67

7.78

85.55

255

7.73

85.60

0

7.73 1485.60

5.50 1491.10

254 +50

5.46

85.44

254

5.42

85.68 mten P

253 +50

5.38

85.72 mten P

5.50

7.73

24.

1491.10

Grade (+4.0)

253

534

1485.76

252 +50

530

8580

o

517

1485.93

737

1493.30

252

746

8584

251 +50

742

8588

251

738

8592

250 +50

734

8596

o

734

1485.96

722

1493.18

250

718

86.00

14.59

12.51

25.

1493.11

249 + 50

7.14

9.00 (+ 1.00)
1486.00

249

7.10

86.08

481

= 11.00

26.

So. section Hubbs - Ditch Section -

Dulzma Conduit

7-18-07.

1498.56

= BM 42

Grade (440)

P. Wiest

Port. Water

Cassin Gate

1.900 1/2 da

043 1498.99

10.55 1488.14

069 1488.83

356

10.67

1478.16

+50

10.71

1478.12

357

10.75

1478.05

+42

10.79

1478.05

0

10.33 1478.50

996 1488.46

358

10.46

1478.00

+50

10.50

1477.96

11.08

2.18

27.

1488.46

Grade (+4.0)

359

10.54

1477.92

+50

10.55

77.88

360

10.62

77.84

+50

10.66

77.80

0

10.66 1477.80

9.81 1487.61

361

9.85

77.76

+49

9.89

0.31

1487.30

= BM 43 (87.26)

362

9.93

9.81

10.66

29.

1487.61

362 +20

421 1493.40

11205 1494.605

+55

1075 1493.530

8.69 1502.22

363

09

1501.3

= Permit

+61

1153 1490.69

523 1495.92

+86

1144 1494.8

29.	Location	Mils	Ditch	Section
		119	1499.75	1498.56
			11.61	1488.14
		070	1488.84	
355	+50-			1064
355	+06			1060
354	+50			1056
354				1052
353	+50			1048
353	+08			1044
352	+50			1040
		189		11.61

Dulyma conduit
- 2m + 2
Grade (+4.0)

7-19-07
R. W. West
Robt. W. West
Cassius Carter

1478.20

7824

7828

7832

7836

7840

7844

31.

1488.64

352

1036

0

870 1480.14

95 1489.70

351 + 50

1138

78.52

351

1114

78.56 MKentR

350 + 50

1110

78.60

350

1106

78.64

0

11060 1486.23

1074 1489.35

349 + 50

1070

78.68

349

1066

78.72

20.30

19.765

Grade(45)

1478.48 MKentR

31.

1489375

348 +50

1062

9mab(+2.0)

1478.76

348 +02

1057

7880

347 +50

1054

7884

0

1054 1476.835

10.5 1488985

347

10.11

7886

346 +70

10.009

7890

+50

10.07

7892

346

10.03

7896

345 +50

9.99

79.00

10.5

10.54

32

1488.985

345

995

344 +50

991

o

991 1479.075

898 1488.055

344

994

343 +50

990

343

996

o

3955 1484.100

464 1488.94

342 +50

970

342

966

13.82

13.965

grad (+4.0)

Commenced work at
Sta 342 +50

1479.04

7-20-07
J. W. West
John Watson
Dan La Rose
Cecilia Carter

79.08

79.12

79.16

79.20

79.24

79.28

33.

148894

341 + 50

9.62

341

9.58

340 + 45

9.54

0

9.54

1479.40

6.95

1486.35

340

6.91

339 + 50

6.87

339 + 06

6.83

338 + 50

6.79

0

7.10

1479.25

6.72

1485.97

13.67

16.64

Grade (+4.0)

147932

7936

7940

7944

7948

7952

7956

34

148597

grad + +0

338 +03

637

1479.60

337 +78

632

79.62

+50

633

79.64

337

629

79.68

336 +50

625

79.73

Ch...

336

621

79.76

0

672

1479.25

669

148594

335 +50

614

79.80

335

610

79.84

669

672

35.

1495.94

334 + 50

6.06

334

6.52

0

6.02 1479.92

10.70 1490.62

333 + 50

10.66

333

10.82

332 + 50

10.59

332

10.84

331 + 50

10.80

10.70

6.02

9.00 (+40)

1479.98

79.92

79.96

80.00

80.04

80.08

80.12

1479.92

DMH

36

149062

331

1046

Grade (4.6)

1480.16

330 + 50

1042

8020

330

1038

8024

329 + 50

1034

8028

329 + 10

1031

8031

0

1031

1480.31

1056

1490.87

328 + 45

1051

8036

327 + 95

1047

8040

327 + 50

1043

8044

1056

1031

37.

1490.97

9000(+40)

148048

327

1039

g

693 148394

523 1489.17

326 +50

865

80.52

326

861

80.56

325 +50

859

80.60

325

853

80.64

324 +50

849

80.68

324

845

80.72

323 +50

841

80.76

523

693

38.

1489.17

841 1480.76

1204 1492.80

323

12.00

322 +50

1196

322 +04

1192

321 +50

1188

321

1184

320 +50

1180

012

1492.68 ✓

-10140

1180 1481.00

1204

20.21

Commenced work at
Sta 323 +00

Grade (+4.0)

7-22-'07.

Cape
P. Wreath
Don la Rue
Cassius Carter

394

8.05 1489.05

1491.00

Grade (+4.0)

320

8.01

1491.04

319 +50

7.97

810.8

319

7.93

811.12

318 +52

7.89

811.16

0

7.89 1491.16

11.25 1492.41

318

11.21

812.0

317 +50

11.17

812.4

19.30

7.89

40.1

149241

316 + 98

11.13

Grade (+4.0)

148128

note: this
315+50 to 299+50
are 0.02' low by
reason of error in
grade.

316 + 50

11.09

8132

316

11.05

8136

0

73

148510

639

149149

315 + 50

10.11

8138

315

10.07

8142

314 + 50

10.03

8146

314

9.99

8150

313 + 50

9.95

8154

639

73

41.

149.49

904(4.0)

o

995 1481.54

795 1489.49

313

791

81.58

312 + 50

787

81.62

312

783

81.66

o

424 1485.25

560 1490.85

311 + 50

905

81.70

310 + 97

911

81.74

310 + 50

907

81.78

310

903

81.82

13.55

14.19

42.

1490.85

309 +50

899

grade (+4.0)

1481.86

309

895

890

308 +57

891

894

308

887

898

o

887 1481.98

792 +8990

307 +50

788

8202

307

784

8206

306 +50

780

8210

o

780 1482.10

779 1489.89

1571

16.67

43.

1489.89

306

775

305 + 50

77

305

767

304 + 50

763

304 + 02

759

0

7.59

148230

6.18 148848

303 + 50

614

303 + 06

610

302 + 50

606

6.18

7.59

Grade (4.0)

148214

82.11

82.22

82.26

82.30

82.34

82.38

82.42

44.

148847

0

606 148242

606 148641

302

602

301 + 50

598

300 + 96

594

299 + 50

590

299 + 90

585

299 + 50

582

0

376 148520

1092 149612

376 149356

1698

12.10

grad(440)

148242

6250

6230

6250

6260

14 6266

(148242)

Note: Hubs 315 + 50 to 299 + 50 are a 0.2' low by error in grade.

- 1 P. on K 8' ± 299 + 26

(149334)

45.

1493.36

4.14 1497.50

10.81 1486.69

0.60 1487.29

298+95

4.57

1482.72

298+50

4.53

82.76

o

12.03 1475.26

T.P. 15' L Sta. 298 on rock.

10.93 1486.19

298

3.39

82.80

4.24 1479.50

o

3.01 1476.49

T.P. on rock

11.94 1488.43

297+50

5.59

82.84

20.92

25.85

Commenced work at Sta 298+95

Grade (+4.0) 7/30/07

E. P. Cope
R. W. White
Don La Rue

1488.43

297

5.55

296+50

5.51

296

5.47

295+50

5.43

o

5.43

1483.00

7.90

1490.90

295

7.86

294+50

7.82

294

7.78

293+50

7.74

7.90

5.43

Jude (+4.0)

1482.88

1482.92

82.96

83.00

83.04

83.08

83.12

83.16

293 1490.90 7.70

292+55 7.66

824 1490.38 8.76 1482.14

292 7.10

291+50 7.06

291 7.02

290+41 6.98

12.01 1495.41 6.98 1483.40

290 11.97

20.25 15.74

grade (+40')
1483.20

no hub 83.24

TP on rock at sta 292+25

no hub 83.28

no hub 83.32

no hub 83.36

83.40

83.44

					Grade (+4.0')
48.					
	1495.41				
289+50			11.93	Notes	83.48
289			11.89	Notes	83.52
288+50			11.85		83.56
288			11.81		83.60
⊙		11.81	1183.60		
	11.52	1495.12			
287+50			11.48		1483.64
287			11.44		1483.68
286+50			11.40		83.72
286			11.36		1483.76
	11.52	11.81			

49.

1495.12

285+50

11.32

1483.80

285

11.28

83.84

284+45

11.24

83.88

284

11.20

83.92

283+51

11.16

83.96

o

11.16 1483.96

7.13

1491.09

283

7.09

84.00

282+50

7.05

84.04

282+13

7.02

84.07 Ditch Grade at Tunnel

11.02

1480.07 Tunnel Grade

7.13

11.16

50. Grade Hub 212 to Entrance # 2

0.26 1507.22 1506.86

0. 1106 1496.16

0.03 1496.19

212 6.52

+50 6.41

0 993 1498.19 793 1488.26

213 + 11 8.46

+50 8.49

214 8.53

+30 8.55

0 7.18 1496.82 8.55 1489.64

+50 7.20

215 7.34

17.50 27.54

Grade +4.0

= 89.32

1489.67

89.78

89.73

89.70

89.66

89.64

89.62

89.51

9-6-07

E. L. Cope

R. W. Wain

Robt. Wain

D. S. R. R.

O'Byrne

Note: grade raised 0.15' at 212 +50

= Entrance # 2

1496.82

11.24

Grade Nubs bet. Exit #2 - Entrance #3

11.11 1495.64

1484.53

226 + 36

695

226

692

225 + 50

688

225

684

224 + 50

680

224

676

Grade +4.0

148538

= Tunnel Grade Entrance #2

9-6-07

= Nub set by OS at Entrance #3

1488.69

✓ = Revised Tunnel Grad (+4.0)

S. L. Cape

P. W. Smith

Watson

Scher

C. Byer

8872

8876

8880

8884

8888

52

1495.64

0

1139

1500.27

676

1488.88

223 + 50

11.35

223 + 11

11.32

222 + 61

11.28

221 + 86

11.22

+ 60

11.20

220 + 95

11.15

+ 50

11.11

220

11.07

1139

676

Grade + 4.0

1488.92

89.95

88.99

89.05

in front of under tree in Birdy hole

89.07

89.32

89.16

89.20

53

219 + 51

1500.27

0

5.14

14944.1

11.00

14892.7

9.17

1103

Grade + 9.0

14892.4

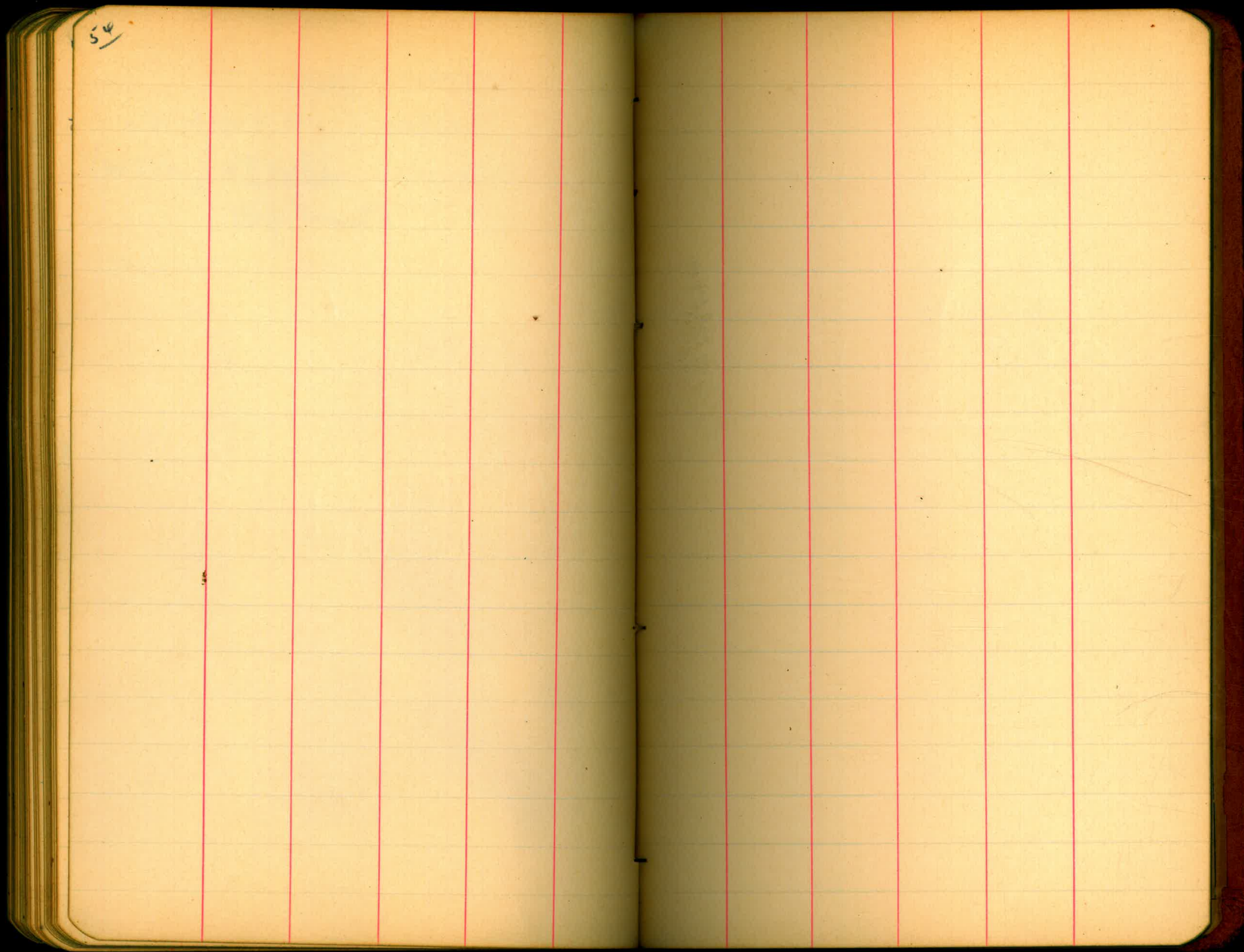
Note:

Sta 219 + 51 =

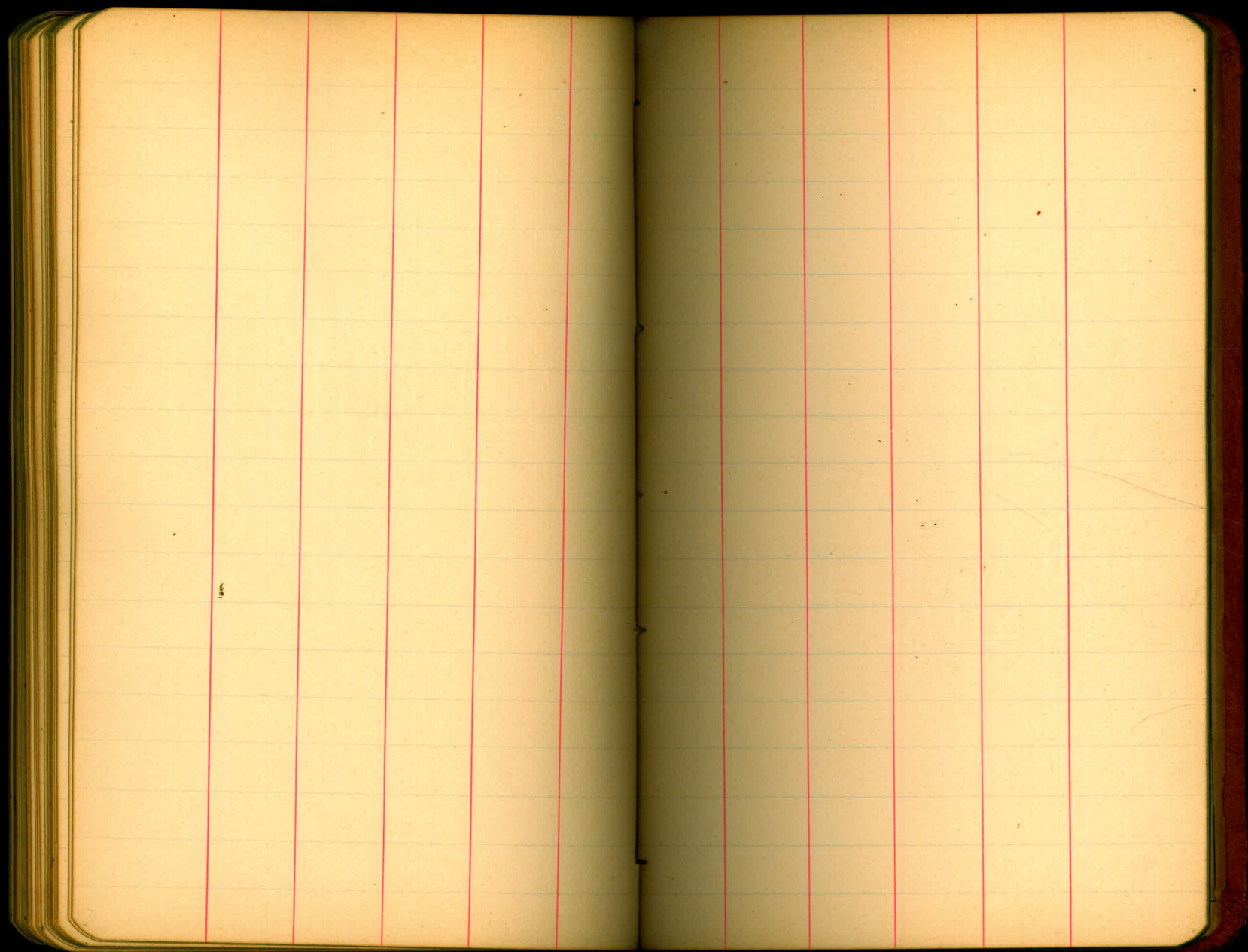
Exit # 2 (14852.4)

14852.4

= Tunnel grade



54



11.10 149063

148453

6.75

148888

4.15 149203

36

379

9924

379

7.75

148529

351 1/2

374

367

358 1/2

368

367

361 = gage

358

1487.56

35

1483.21

1484.00

35

1483.69

163

450

613

368

258

610

610

610

613

256

359

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.

FOR SINGLE TRACK EMBANKMENT.

ROADWAY 14 FEET WIDE. SIDE SLOPES 1 1/2 TO 1.

	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	7.0	7.2	7.3	7.5	7.6	7.8	7.9	8.1	8.2	8.4	0
1	8.5	8.7	8.8	9.0	9.1	9.3	9.4	9.6	9.7	9.9	1
2	10.0	10.2	10.3	10.5	10.6	10.8	10.9	11.1	11.2	11.4	2
3	11.5	11.7	11.8	12.0	12.1	12.3	12.4	12.6	12.7	12.9	3
4	13.0	13.2	13.3	13.5	13.6	13.8	13.9	14.1	14.2	14.4	4
5	14.5	14.7	14.8	15.0	15.1	15.3	15.4	15.6	15.7	15.9	5
6	16.0	16.2	16.3	16.5	16.6	16.8	16.9	17.1	17.2	17.4	6
7	17.5	17.7	17.8	18.0	18.1	18.3	18.4	18.6	18.7	18.9	7
8	19.0	19.2	19.3	19.5	19.6	19.8	19.9	20.1	20.2	20.4	8
9	20.5	20.7	20.8	21.0	21.1	21.3	21.4	21.6	21.7	21.9	9
10	22.0	22.2	22.3	22.5	22.6	22.8	22.9	23.1	23.2	23.4	10
11	23.5	23.7	23.8	24.0	24.1	24.3	24.4	24.6	24.7	24.9	11
12	25.0	25.2	25.3	25.5	25.6	25.8	25.9	26.1	26.2	26.4	12
13	26.5	26.7	26.8	27.0	27.1	27.3	27.4	27.6	27.7	27.9	13
14	28.0	28.2	28.3	28.5	28.6	28.8	28.9	29.1	29.2	29.4	14
15	29.5	29.7	29.8	30.0	30.1	30.3	30.4	30.6	30.7	30.9	15
16	31.0	31.2	31.3	31.5	31.6	31.8	31.9	32.1	32.2	32.4	16
17	32.5	32.7	32.8	33.0	33.1	33.3	33.4	33.6	33.7	33.9	17
18	34.0	34.2	34.3	34.5	34.6	34.8	34.9	35.1	35.2	35.4	18
19	35.5	35.7	35.8	36.0	36.1	36.3	36.4	36.6	36.7	36.9	19
20	37.0	37.2	37.3	37.5	37.6	37.8	37.9	38.1	38.2	38.4	20
21	38.5	38.7	38.8	39.0	39.1	39.3	39.4	39.6	39.7	39.9	21
22	40.0	40.2	40.3	40.5	40.6	40.8	40.9	41.1	41.2	41.4	22
23	41.5	41.7	41.8	42.0	42.1	42.3	42.4	42.6	42.7	42.9	23
24	43.0	43.2	43.3	43.5	43.6	43.8	43.9	44.1	44.2	44.4	24
25	44.5	44.7	44.8	45.0	45.1	45.3	45.4	45.6	45.7	45.9	25
26	46.0	46.2	46.3	46.5	46.6	46.8	46.9	47.1	47.2	47.4	26
27	47.5	47.7	47.8	48.0	48.1	48.3	48.4	48.6	48.7	48.9	27
28	49.0	49.2	49.3	49.5	49.6	49.8	49.9	50.1	50.2	50.4	28
29	50.5	50.7	50.8	51.0	51.1	51.3	51.4	51.6	51.7	51.9	29
30	52.0	52.2	52.3	52.5	52.6	52.8	52.9	53.1	53.2	53.4	30
31	53.5	53.7	53.8	54.0	54.1	54.3	54.4	54.6	54.7	54.9	31
32	55.0	55.2	55.3	55.5	55.6	55.8	55.9	56.1	56.2	56.4	32
33	56.5	56.7	56.8	57.0	57.1	57.3	57.4	57.6	57.7	57.9	33
34	58.0	58.2	58.3	58.5	58.6	58.8	58.9	59.1	59.2	59.4	34
35	59.5	59.7	59.8	60.0	60.1	60.3	60.4	60.6	60.7	60.9	35
36	61.0	61.2	61.3	61.5	61.6	61.8	61.9	62.1	62.2	62.4	36

Calculated by Julien A. Hall, M. Am. Soc. C. E.