

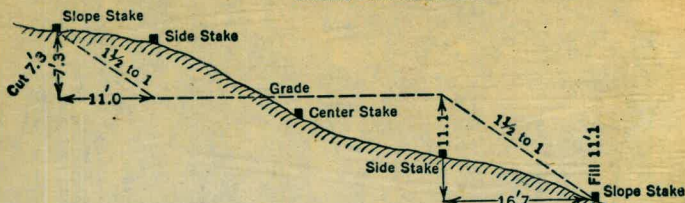
MISSION BAY

70

**DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING**

Roadway of any Width. Side Slopes 1 1/2 to 1.

In the figure below: opposite 7 under "Cut or Fill" and under .3 read 11.0, the distance out from the side stake at left. Also, opposite 11 under "Cut or Fill" and under .1 read 16.7, the distance out from the side stake at right.



Cut or Fill	Distance out from Side or Shoulder Stake										Cut or Fill
	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	0.0	0.2	0.3	0.5	0.6	0.8	0.9	1.1	1.2	1.4	0
1	1.5	1.7	1.8	2.0	2.1	2.3	2.4	2.6	2.7	2.9	1
2	3.0	3.2	3.3	3.5	3.6	3.8	3.9	4.1	4.2	4.4	2
3	4.5	4.7	4.8	5.0	5.1	5.3	5.4	5.6	5.7	5.9	3
4	6.0	6.2	6.3	6.5	6.6	6.8	6.9	7.1	7.2	7.4	4
5	7.5	7.7	7.8	8.0	8.1	8.3	8.4	8.6	8.7	8.9	5
6	9.0	9.2	9.3	9.5	9.6	9.8	9.9	10.1	10.2	10.4	6
7	10.5	10.7	10.8	11.0	11.1	11.3	11.4	11.6	11.7	11.9	7
8	12.0	12.2	12.3	12.5	12.6	12.8	12.9	13.1	13.2	13.4	8
9	13.5	13.7	13.8	14.0	14.1	14.3	14.4	14.6	14.7	14.9	9
10	15.0	15.2	15.3	15.5	15.6	15.8	15.9	16.1	16.2	16.4	10
11	16.5	16.7	16.8	17.0	17.1	17.3	17.4	17.6	17.7	17.9	11
12	18.0	18.2	18.3	18.5	18.6	18.8	18.9	19.1	19.2	19.4	12
13	19.5	19.7	19.8	20.0	20.1	20.3	20.4	20.6	20.7	20.9	13
14	21.0	21.2	21.3	21.5	21.6	21.8	21.9	22.1	22.2	22.4	14
15	22.5	22.7	22.8	23.0	23.1	23.3	23.4	23.6	23.7	23.9	15
16	24.0	24.2	24.3	24.5	24.6	24.8	24.9	25.1	25.2	25.4	16
17	25.5	25.7	25.8	26.0	26.1	26.3	26.4	26.6	26.7	26.9	17
18	27.0	27.2	27.3	27.5	27.6	27.8	27.9	28.1	28.2	28.4	18
19	28.5	28.7	28.8	29.0	29.1	29.3	29.4	29.6	29.7	29.9	19
20	30.0	30.2	30.3	30.5	30.6	30.8	30.9	31.1	31.2	31.4	20
21	31.5	31.7	31.8	32.0	32.1	32.3	32.4	32.6	32.7	32.9	21
22	33.0	33.2	33.3	33.5	33.6	33.8	33.9	34.1	34.2	34.4	22
23	34.5	34.7	34.8	35.0	35.1	35.3	35.4	35.6	35.7	35.9	23
24	36.0	36.2	36.3	36.5	36.6	36.8	36.9	37.1	37.2	37.4	24
25	37.5	37.7	37.8	38.0	38.1	38.3	38.4	38.6	38.7	38.9	25
26	39.0	39.2	39.3	39.5	39.6	39.8	39.9	40.1	40.2	40.4	26
27	40.5	40.7	40.8	41.0	41.1	41.3	41.4	41.6	41.7	41.9	27
28	42.0	42.2	42.3	42.5	42.6	42.8	42.9	43.1	43.2	43.4	28
29	43.5	43.7	43.8	44.0	44.1	44.3	44.4	44.6	44.7	44.9	29
30	45.0	45.2	45.3	45.5	45.6	45.8	45.9	46.1	46.2	46.4	30
31	46.5	46.7	46.8	47.0	47.1	47.3	47.4	47.6	47.7	47.9	31
32	48.0	48.2	48.3	48.5	48.6	48.8	48.9	49.1	49.2	49.4	32
33	49.5	49.7	49.8	50.0	50.1	50.3	50.4	50.6	50.7	50.9	33
34	51.0	51.2	51.3	51.5	51.6	51.8	51.9	52.1	52.2	52.4	34
35	52.5	52.7	52.8	53.0	53.1	53.3	53.4	53.6	53.7	53.9	35
36	54.0	54.2	54.3	54.5	54.6	54.8	54.9	55.1	55.2	55.4	36
37	55.5	55.7	55.8	56.0	56.1	56.3	56.4	56.6	56.7	56.9	37
38	57.0	57.2	57.3	57.5	57.6	57.8	57.9	58.1	58.2	58.4	38
39	58.5	58.7	58.8	59.0	59.1	59.3	59.4	59.6	59.7	59.9	39
40	60.0	60.2	60.3	60.5	60.6	60.8	60.9	61.1	61.2	61.4	40

KEUFFEL & ESSER CO., N. Y.

MICROFILMED

JAN 7 1965

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JAN 1988

U.S. GEOLOGICAL SURVEY  
WATER RESOURCES DIVISION  
RESTON, VIRGINIA 20192

## BENCH LEVELS

8-22-51  
E.F. Watson  
A.E. Sherry  
R.D. Shorey

①

## TIERRA DEL FUEGO WEST HALF

Px

Sta	+	H.I.	-	Elev.	
"Causeway"				10.835	U.S.C. & G.S. B.M. No 1 BM. a brass cap in E. curb 75' N of N. end of S. Causeway Bridge
	5.090	15.925			
Elec. M.H.			3.895	12.030	a Lead Plug about 5" from ring in N. Ely Portion of 5' x 6" Elec. M.H. Near Causeway Bk Sta 80+00
	5.148	17.178			
Flag Pole			2.160	15.018	2 Copper Nails in top of base of Flag Pole at East End and E. of Model Yacht Pond n.w. corner of Base of Pole
Elec M.H.			5.185	11.993	a Lead Plug about 5" from ring in N. Ely portion of 5' x 6" Elec M.H. Near Causeway Bk Sta 84+35
	5.865	17.858			
T.P.			3.142	14.716	
	4.490	19.206			
T.P.			5.548	13.658	
	3.561	17.219			
Top of Fire Hydrant			1.770	15.449	Top of Fire Hydrant approx. 25' S. Wly of Sta 11+30 of Water near Center of Tierra
T.P.			3.850	13.369	
	5.424	18.793			
Barbecue Pit			3.580	15.213	a Lead Plug & Tack in S. Wly Corner of Conc. Barbecue Pit on Tierra N.W. Portion

BENCH LEVELS  
TIERRA DEL FUEGO West Half

Cont'd 8-22-51

(2)

PX

Sta	+	H.I.	-	Elev.	
Barbecue Pit				15.213	See Page
	3.580	18.793			
T.P.			4.841	13.952	
	3.978	17.930			
T.P.			4.777	13.153	
	3.065	16.218			
West Flag Pole			4.947	11.271	2 Copper nails in S.W. Corner of Base of Flag Pole at West end & on E. of Model Yacht Pond
T.P.			5.030	11.188	
	5.555	16.743			
Conc. Mon.			3.500	13.243	a 6" x 6" Conc. Mon. Center of 400' Radius at South WLY Portion of Tierra
T.P.			3.427	13.316	
	4.378	17.694			
Tide Water Control M.H.			3.665	14.029	a Lead Plug & Tack S.Wly Corner of Tide Water Control M.H. Wly of Club House
	4.430	18.459			
T.P.			4.670	13.789	
	3.582	17.371			
"Causeway"			6.525	10.846	USE <u>10.835</u> See Page No ①



RANGE 3 - SOUTH  
 SOUNDINGS 5. MISSION BAY

## ENTRANCE CHANNEL

STA.	SOUND	STA.	SOUND	Sta.	SOUND	Sta.	SOUND	Sta.	SOUND		
CONTROLS		CONTROLS		Controls		Controls		Controls			
Looking W. Sta. 30+00 46°30'	10.5	9.5	L.W. Sta. 20+00	12.5	11.4	(2.25)	9.0	7.8	10.0	8.8	
(3.13)	11.0	10.0	41°15'	13.0	11.9		10.0	<del>7.8</del> 8.8	11.0	<del>8.8</del> 9.8	
L.W. Sta. 30+00 52°05'	12.0	11.0		12.5	11.4	L.W. Sta. 20+00	9.0	7.8	L.W. Sta. 12+42 10+00	10.0	8.8
	16.0	15.0		13.0	11.7	79°30'	11.0	<del>8.8</del> 9.8	56°30'	10.5	<del>9.0</del> 9.3
(7.0)	15.0	14.0	L.W. Sta. 20+00	11.5	11.4		9.0	7.8	(1.2)	10.0	8.8
	17.0	16.0	46°00'	12.0	10.2		10.5	<del>8.3</del> 9.3		11.0	<del>9.0</del> 9.8
Looking W. Sta. 30+00 66°00'	16.0	15.0		10.0	8.9	L.W. Sta. 12+42 10+00	9.5	8.3	L.W. Sta. 12+42 10+00	10.0	8.8
	16.0	15.0	(1.1)	10.0	8.2	38°10'	9.5	8.3	69°25'	10.0	8.8
	14.0	13.0	L.W. Sta. 20+00	9.5	8.4		9.5	8.3		9.0	7.8
Looking W. Sta. 20+00 32°30'	15.0	14.0	52°05'	10.0	8.9	(1.2)	10.5	<del>8.3</del> 8.3		9.5	8.3
	15.0	14.0		8.5	7.4	L.W. Sta. 12+42 10+00	10.0	8.8	L.W. Sta. 12+42 10+00	8.5	7.3
	15.0	14.0		11.0	9.9		10.0	8.8	75°40'	10.5	<del>8.3</del> 9.3
Looking W. Sta. 20+00 85°10'	15.0	14.0	L.W. Sta. 20+00	8.5	7.4	L.W. Sta. 12+42 10+00	10.0	8.8	(3.35)	8.5	7.3
	15.0	14.0	59°36'	10.0	8.9	45°10'	10.0	8.8		10.5	<del>8.0</del> 9.3
	14.5	13.5		8.5	7.4		10.0	8.8	L.W. Sta. 12+42 10+00	8.5	7.3
	15.0	14.0		10.5	<del>8.4</del> 9.4	(9.30)	10.0	8.8	94°52'	9.0	7.8
(9.19)	14.0	13.0	L.W. Sta. 20+00	8.5	7.4	L.W. Sta. 12+42 10+00	10.0	8.8		9.0	7.8
	14.0	13.0	68°22'	12.0	<del>8.9</del> 10.9	49°15'	9.5	8.3		12.0	<del>18.8</del>

 T. Stamper  
 R. Sisson  
 R. Shorey  
 A. Sherry  
 R. Parks

## RANGE 3 South

⑤

Sta.	Sound	L.E.	Sta.	Sound
L.E.	10.0	8.7	30°30'	34.0 32.7
Sta 20+00		9.7	(1.3)	
58°02'	12.0	<del>10.7</del>	(9.45)	
	11.0	9.7		
(1.3)	13.0	11.7		
	13.0	11.7		
L.E.				
Sta 20+00	14.0	12.7		
50°10'	15.0	13.7		
	15.0	13.7		
(9.40)	15.0	13.7		
L.E.				
Sta 20+00	17.0	15.7		
42°33'	17.0	15.7		
	20.0	18.7		
	23.0	21.7		
L.E.				
Sta 20+00	27.0	25.7		
34°40'	29.0	27.7		
	30.0	28.7		
	32.0	30.7		
	32.0	30.7		



Range 1 South  
MISSION BAY

5-27-52

(6)

Entrance Channel

Sta.	Sound	Sta.	Sound	PX	Sta.	Sound	Sta.	Sound
Control L <sup>2</sup> Sta. 30+00 48°30' L.W. (9:51)	13.0 18.0	11.6 <del>12.6</del> 16.6	11.0 12.0	9.5 <del>9.0</del> 10.5	Control R <sup>2</sup> Sta. 20+00 68°10' L.W.	9.0 9.0	7.5 7.5	(10:10) 9.0 10.0 8.4
L.W. Sta. 30+00 54°50' (1.4)	17.0 16.0	15.6 14.6	10.0 10.0	8.5 8.5	78°25' L.W. Sta. 20+00 78°25' (1.5)	9.5 9.5	7.0 7.5	10.0 8.4
L.W. Sta. 30+00 64°00' (7:55)	16.5 16.0	15.1 14.6	10.0 9.5	8.5 8.0	Sta. 20+00 81°15' L.W. Sta. 20+00 81°15'	10.0 10.0	8.5 7.5	11.0 10.0 8.4
L.W. Sta. 30+00 76°25' (7:55)	17.0 14.5	15.6 13.1	9.5 9.5	8.0 8.0	Sta. 20+00 84°00' L.W. Sta. 20+00 84°00'	10.0 10.0	8.5 7.5	11.0 9.5 7.9
L.W. Sta. 30+00 86°25'	16.5 13.0	15.1 11.6	9.5 9.0	8.0 7.5	Sta. 20+00 86°00' L.W. Sta. 20+00 86°00'	9.5 9.5	8.0 8.0	10.0 9.5 7.9
L.W. Sta. 30+00 86°25'	15.0 13.0	13.6 11.6	9.0 9.0	7.5 7.5	Sta. 20+00 88°35' L.W. Sta. 20+00 88°35'	11.0 10.0	8.5 7.5	10.0 9.5 7.9
L.W. Sta. 30+00 86°25'	15.0 13.0	11.6 11.6	9.0 9.0	7.5 7.5	Sta. 20+00 90°00' L.W. Sta. 20+00 90°00'	9.5 10.0	8.0 8.5	9.5 9.5 7.9
L.W. Sta. 30+00 86°25'	13.0 13.0	11.6 11.6	9.0 10.0	7.5 8.5	Sta. 20+00 93°30' L.W. Sta. 20+00 93°30'	9.5 10.5	8.0 8.0	(10:15) 9.5 7.9
L.W. Sta. 30+00 86°25'	13.0	11.6	10.0	8.5	Sta. 20+00 93°30'	10.5	8.0	9.5 7.9

Range 1 South  
Mission Bay

RANGE 1 - NORTH  
ENTR CHANNEL - MISS. BAY

(7)

Entrance Channel				ENTR CHANNEL - MISS. BAY							
Sta. Control L <sup>s</sup> Sound		Sta. Control L <sup>s</sup> Sound		Sta. Control L <sup>s</sup> Sound		Sta. Control L <sup>s</sup> Sound	PX				
				30+00 49°08'	10.0	8.0	11.0	8.9			
L.W.	10.0	8.3	18.0	14.3	10.0	8.0	10.5	8.4			
Sta. 12+42	12.0	<del>10.3</del> 8.9	L.E. Sta. 20+00	18.0	<del>16.3</del> (2.0)	10.0	8.0	10.5	8.4		
<sup>18</sup> 10+00 79°40'	10.0	8.3	<sup>22</sup> 46°00'	16.5	14.5	10.0	8.0	10.5	8.4		
	10.0	8.3		16.0	14.3	<sup>38</sup> 400 56°02'	9.5	LW STA 20+00	11.0	8.9	
(1.7)	10.0	8.3	(10:23)	16.0	14.3	LW	10.5	8.5	43°40'	10.5	8.4 ✓
L.W. Sta. 12+42	11.5	9.8	L.E. Sta. 20+00	15.0	13.3		10.0	8.0	(2.1)	10.0	7.9
<sup>19</sup> 10+00 97°52'	10.0	8.3	<sup>23</sup> 39°30'	17.0	15.3	LW	11.0	<del>8.0</del> 9.0		10.0	7.9
(10:18)	11.0	9.3	(1.7)	17.0	15.3	66°52'	10.0	8.0	(10:54)	10.0	7.9
	11.5	9.8		25.0	23.3	30+00	10.0	8.0	LW STA 20+00	10.0	7.9
L.W. Sta. 12+42	12.0	10.3	L.E. Sta. 20+00	25.0	23.3		10.0	8.0	53°25'	10.0	7.9 ✓
<sup>20</sup> 10+00 117°50'	12.0	10.3	<sup>24</sup> 32°52'	27.0	25.3	LW 30+00	10.5	8.5		10.0	7.9
	13.0	11.3				78°30'	10.0	8.0		10.0	7.9
	13.5	11.8				(10:50)	10.0	8.0	LW STA 20+00	10.5	8.4
L.E. Sta. 20+00	14.5	12.8					10.0	8.0	61°17'	10.0	7.9 ✓
<sup>21</sup> 58°08'	14.0	12.3				LW 30+00	11.0	<del>8.0</del> 9.0	(10:56)	10.0	7.9
	15.0	<del>13.3</del>				97°25'	10.0	8.0		9.5	7.4
	15.0	13.3							LW STA 20+00	10.0	7.9
	17.5	<del>15.8</del> 14.0							72°13'	10.0	7.9 ✓

Sta		R-1-		N. CONTD		Sta		R1-N. CONTD	
Control	Sound	Control	Sound	Control	Sound	Control	Sound	Control	Sound
(1058)	10.0	7.9	12.0	9.8	65°40'	11.5	9.2		
	10.0	7.9	(11:04)	11.0	8.8	130	10.7		
∠ W			∠ W						
STA 20400	11.0	8.9	12740	11.0	8.8	12.0	9.7		
86°02'	9.5	7.4	67°50'	12.0	9.8	14.5	9.7		
	10.0	7.9		13.0	10.8	52°15'	13.0	10.7	
(11:00)	10.0	7.9		12.0	9.8		12.5	10.2	
∠ W			∠ W			(2.3)	12.0	9.7	
STA 20400	10.0	7.9	12740	13.0	10.8	14.5	10.9		
103°50'	10.0	7.9	77°40'	11.0	8.8	14.5	12.2		
(2.1)	12.0	9.9	(2.2)	13.0	10.8	13.0	10.7		
	10.0	7.9	(11:07)	12.0	9.8	(11:15)	19.0	16.7	
∠ W			∠ W				18.0	15.7	
12740	11.0	8.9	12740	12.5	10.3		19.0	16.7	
10400	10.0	7.9	88°32'	12.0	9.8	19.0	16.7		
45°40'	10.5	8.4		12.5	10.3	17°05'	22.0	19.7	
(11:02)	10.0	7.9		11.5	9.3		23.0	20.7	
∠ W			∠ W				25.0	22.7	
12740	10.5	8.4	12740	11.0	8.8		32.0	29.7	
10400	10.0	7.9	10240	11.5	9.3	32.0	29.7		
52°0'	10.0	7.9	(11:10)	11.0	8.8	32°15'			
	10.5	8.4		12.0	9.8	(11:17)			
∠ W			∠ W						
12740	11.0	8.9		11.0	8.8				
10400	11.0	8.9	∠ E	13.0	10.8				
58°15'	11.0	8.9	20400	13.0	10.8				

RANGE 3 NORTH

MISSION BAY

ENTRANCE CHANNEL

PX

STA. R3  
CONTROL SOUND  
CW

STA. 3  
CONTROL SOUND  
CW

(9)

STA. CONTROL SOUND	STA. CONTROL SOUND	STA. CONTROL SOUND	STA. CONTROL SOUND	STA. CONTROL SOUND	STA. CONTROL SOUND	STA. CONTROL SOUND	STA. CONTROL SOUND	STA. CONTROL SOUND	STA. CONTROL SOUND	
44°26'	6.0	3.5	9.0	6.5	10.5	7.9	12.5	9.8		
(11:24)	7.0	4.5	9.0	6.5	10.5	7.9	11.5	8.8		
7.0	4.5	10.0	7.5	11.5	8.9	12.5	9.8			
7.0	4.5	100.50	9.0	6.5	10.5	7.9	10.0	8.3	✓	
47°33'	7.0	4.5	(2.5)	9.5	7.0	(2.6)	13.0	10.7	12.0	9.3
(2.5)	7.0	4.5	(11:30)	9.5	7.0	11.0	8.4	(11:44)	11.0	8.3
(11:26)	7.0	4.5	10.0	7.5	11.0	8.4	12.0	9.3		
7.5	5.0	43°15'	10.0	7.5	11.0	8.4	54°22'	10.0	7.3	✓
54°15'	7.5	5.0	10.0	7.5	12.5	9.9	(2.7)	11.0	8.3	
7.0	4.5	10.5	8.0	11.5	8.9	10.0	7.3			
(11:28)	8.0	5.5	10.5	8.0	12.5	9.9	10.0	7.3		
8.0	5.5	50°28'	10.5	8.0	12.5	9.9	46°05'	9.0	6.3	✓
64°25'	8.0	5.5	(11:33)	10.5	8.0	12.5	9.9	15.0	12.3	
9.0	6.5	10.5	8.0	(11:40)	12.0	9.4	(11:47)	18.0	15.3	
8.0	5.5	10.5	8.0	12.5	9.9	22.0	19.3			
8.5	6.0	60°0'	10.5	8.0	12.5	9.9	39°13'	23.0	20.3	✓
78°48'	8.5	6.0	10.0	7.5	12.5	9.9	27.0	24.3		
(11:29)	10.0	7.5	12.0	9.4	27.0	24.3				

R 3 N CONT'D.

(10)

STA.  
CONTROL SOUND

STA. SOUND  
CONTROL SOUND

CF (2.8)  
STA. 20+00 29.0 26.2

35° 23' <sup>20</sup> 30.0 27.2

(1148)

7-25-52

R. Sisson  
A. Sherry  
R. Shorey

Px

①

## BENCH LEVELS

VICINITY VENTURA &amp; GLEASON POINTS

STA.	+	H.I.	-	ELEV.	
"COASTER"				11.39	B.M. A U.S.C. # 95. (ABOUT 300 YDS. E. MISSION BEACH ROLLER COASTER (N. 7,545.37 W. 19,143.70) CON. MON. ON W. SHORE MISSION BAY)
	4.56	15.95			
ELEC. MANHOLE			5.75	10.20	(A 5'x6' CONCRETE M.H. (N. 7,767.65 W. 19,537.48) NO. 1. L&T. APPROX. 0.5' N.E. OF M.H. RING
ELEC. MANHOLE			3.67	12.28	(A 5'x6' CONCRETE M.H. (N. 7,788.83 W. 19,026.42) NO. 2. L&T. APPROX. 0.9' S.W. OF M.H. RING
	4.73	17.01			
ELEC. MANHOLE			4.63	12.38	(A 5'x6' CONCRETE M.H. (N. 7,776.80 W. 18,537.61) NO. 7. L&T. APPROX. 0.5' N.E. OF M.H. RING
	3.70	16.08			
T.P.			5.09	10.99	
	4.53	15.52			
ELEC. MANHOLE			4.76	10.76	(A 5'x6' CONCRETE M.H. (N. 7,115.51 W. 18,221.46) NO. 5. L&T. APPROX. 0.45' S.E. OF M.H. RING
	4.92	15.68			
T.P.			4.07	11.61	
	4.62	16.23			
ELEC. MANHOLE			4.44	11.79	(A 5'x6' CONCRETE M.H. (N. 6,797.30 W. 17,790.44) NO. 6. L&T. APPROX. 0.4' S.E. OF M.H. RING
	4.79	16.58			
T.P.			6.03	10.55	

## BENCH LEVELS - CONTINUED

## VICINITY VENTURA &amp; GLEASON POINTS

STA.	+	H.I.	-	ELEV.
T.P.				10.55

4.70 15.25

FLAGPOLE

2.32 12.93

2.23 15.16

T.P.

4.65 10.51

5.17 15.68

T.P.

4.89 10.79

4.61 15.40

T.P.

5.34 10.06

4.90 14.96

T.P.

4.15 10.81

4.69 15.50

"COASTER"

4.12 11.38

USE (SEE PAGE 11 FOR DESCRIPTION.)

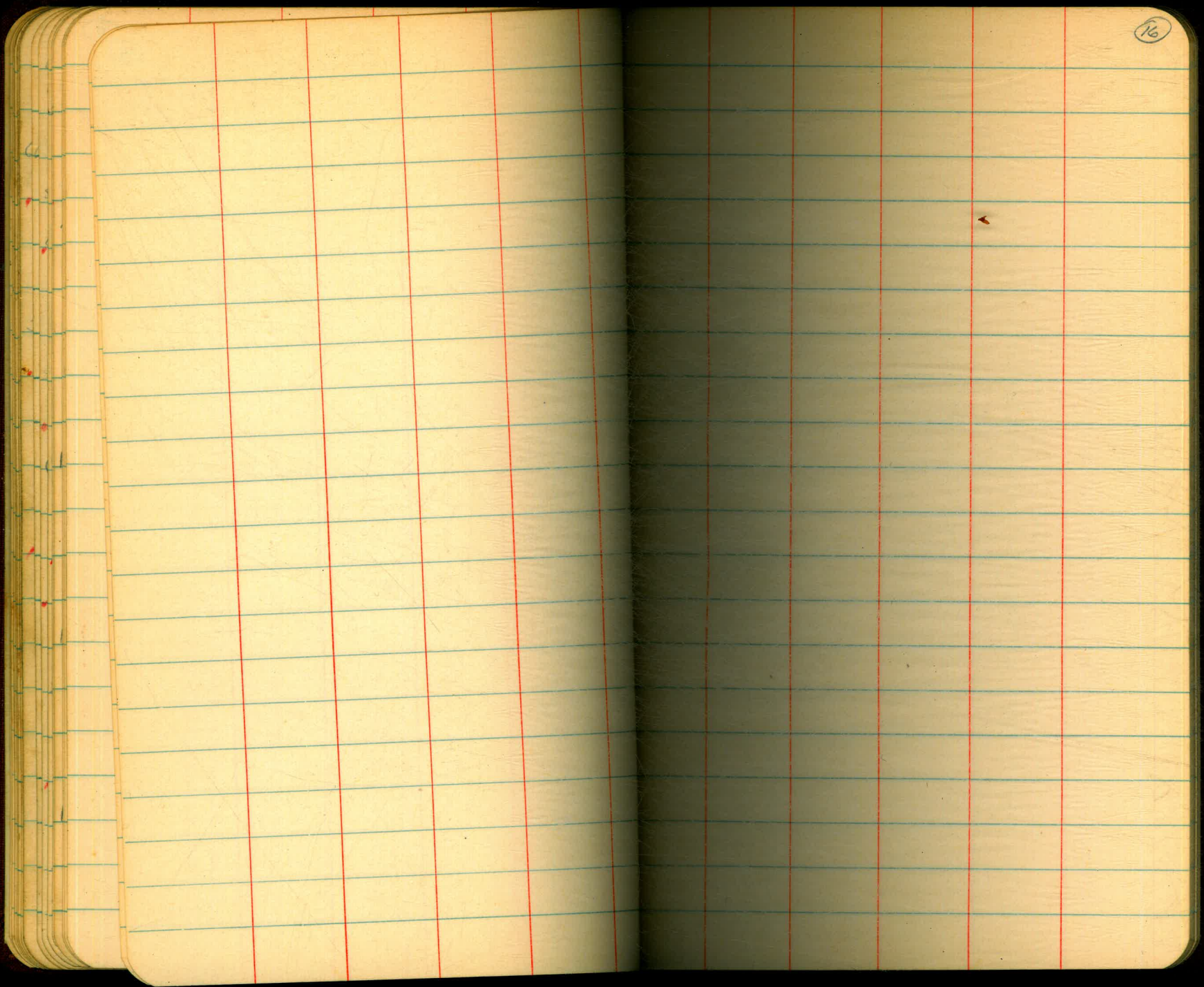
11.39 USC # 33. CON. MON.LEAD PLUG INSTALLED IN TOP OF CONCRETE  
(N. 7, 253.54)  
BASE OF STEEL FLAGPOLE (W. 17, 533.72)







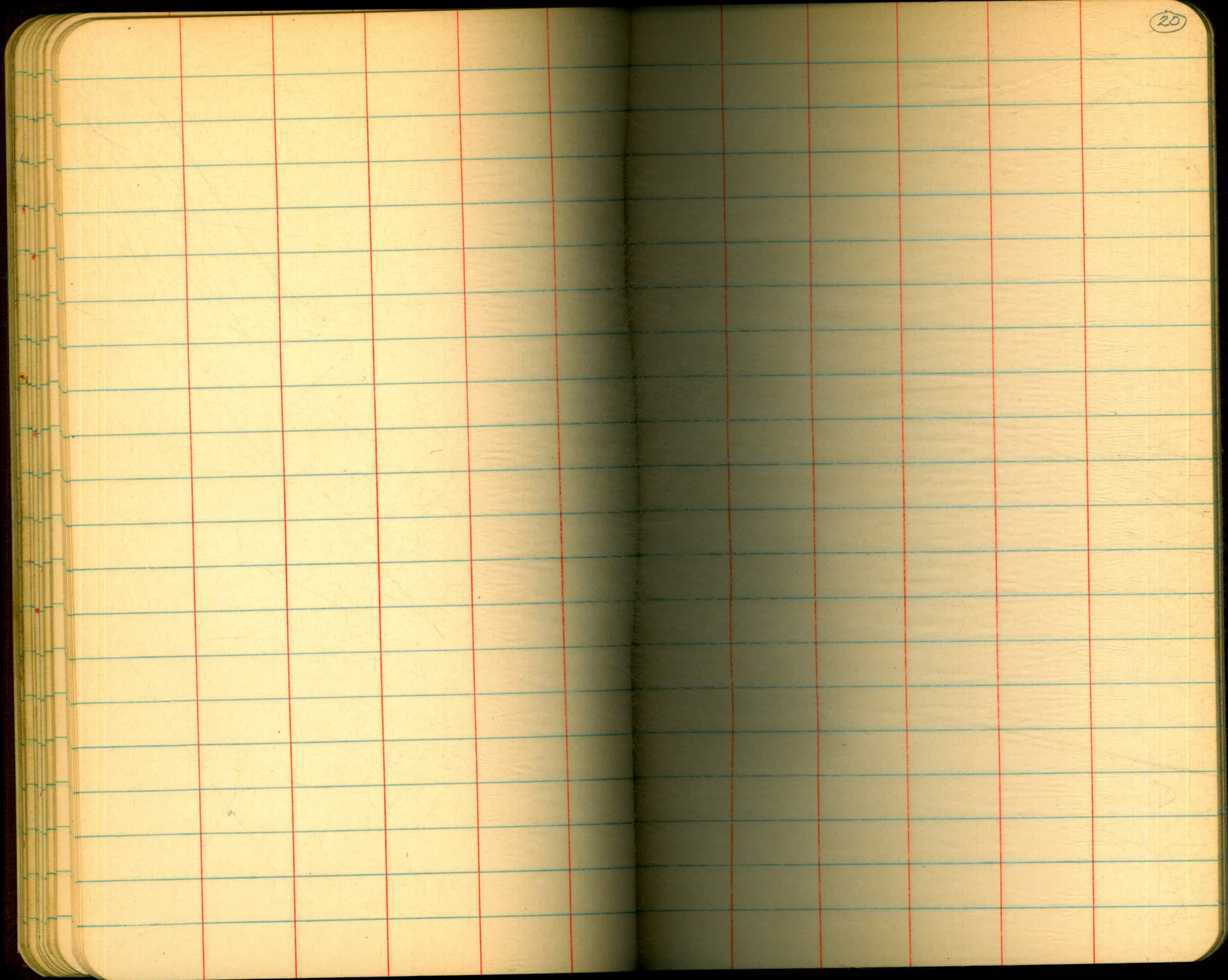


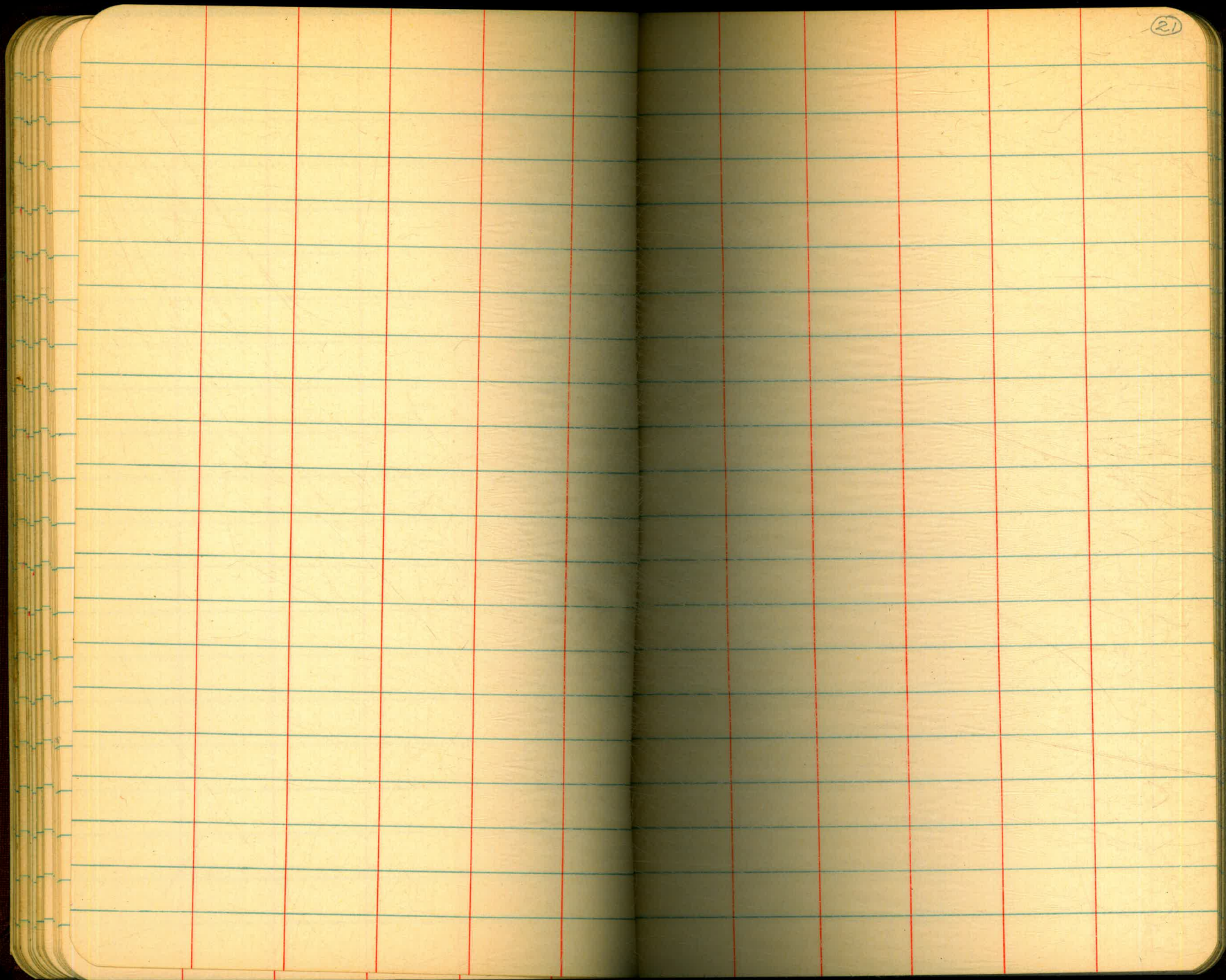














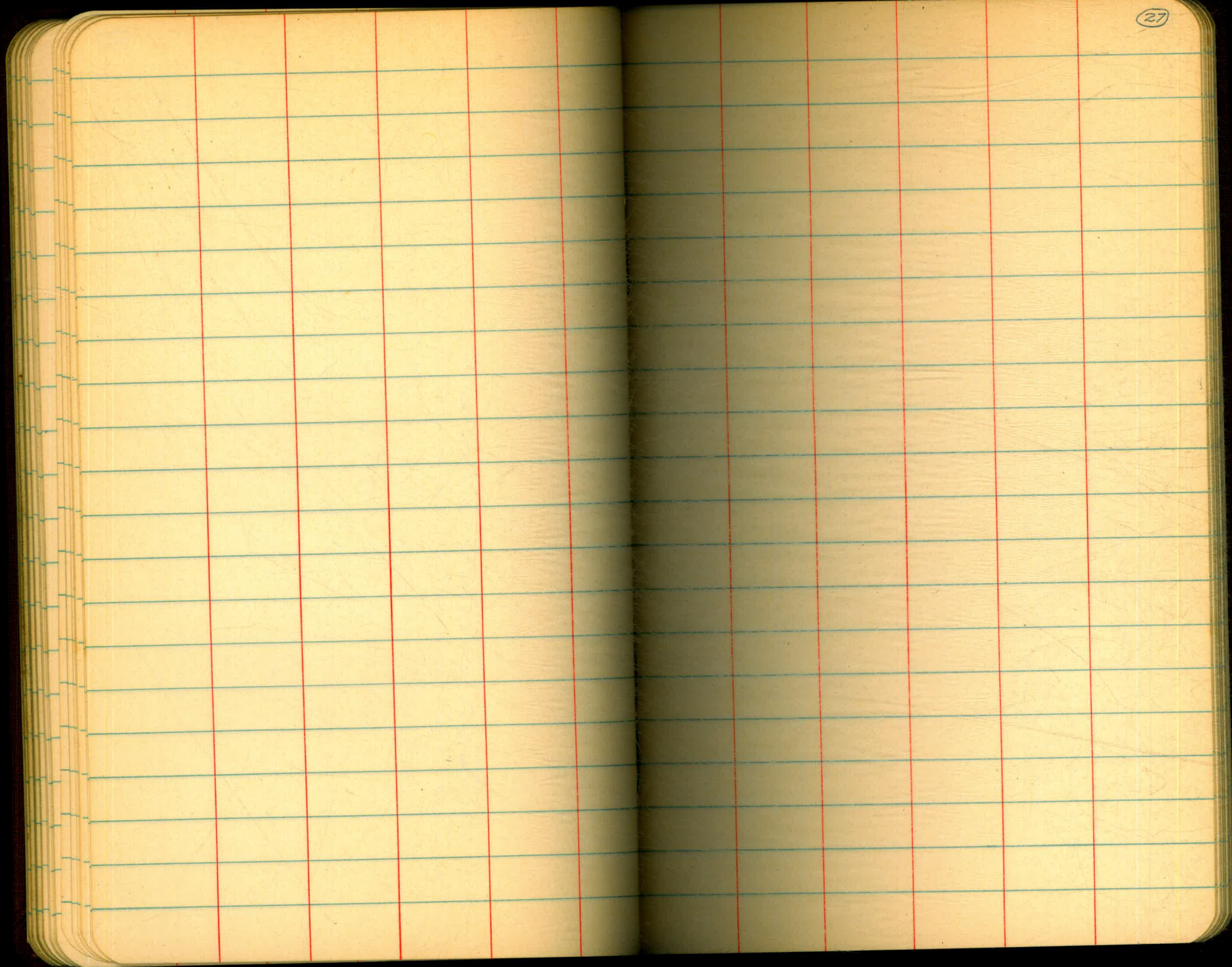


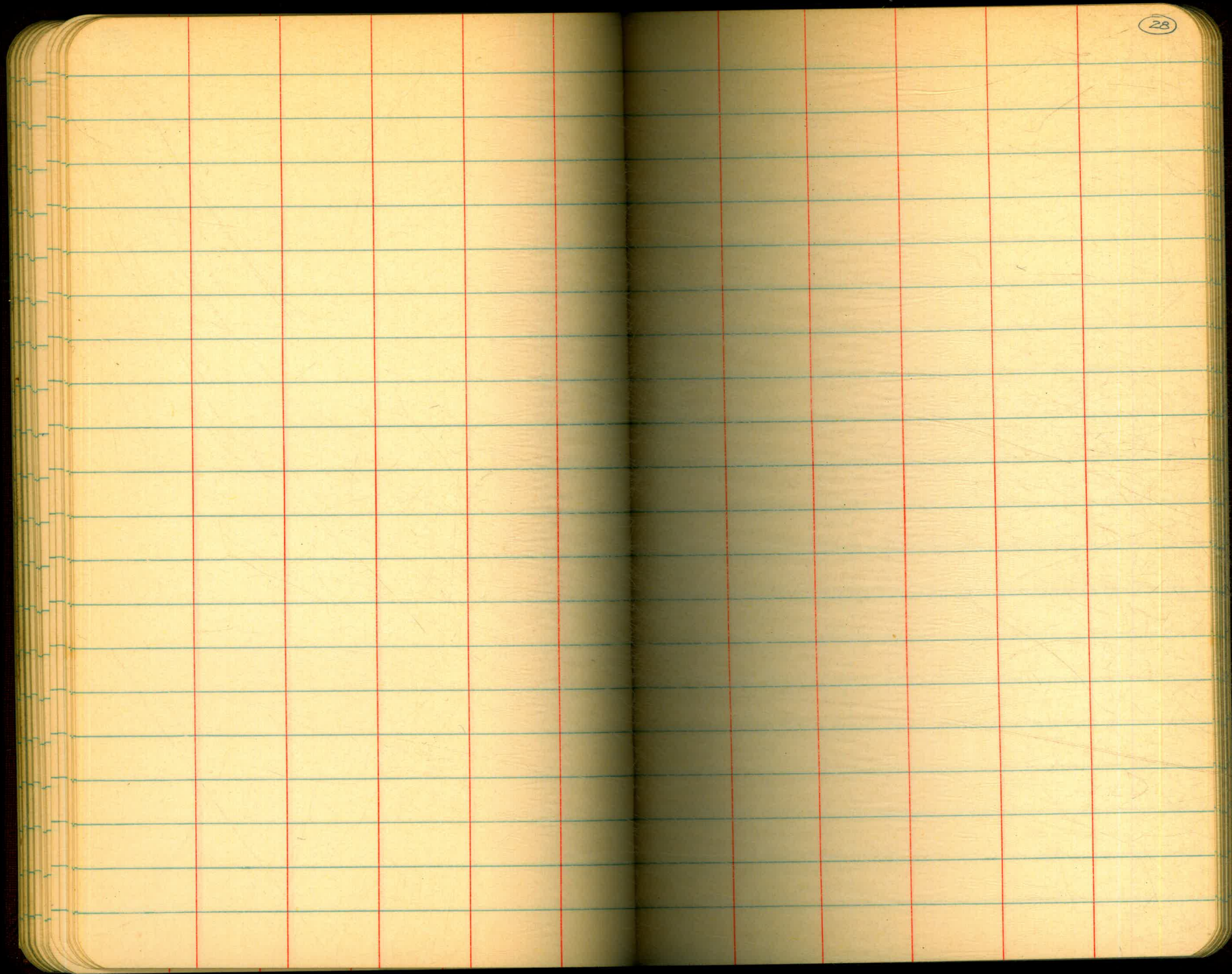


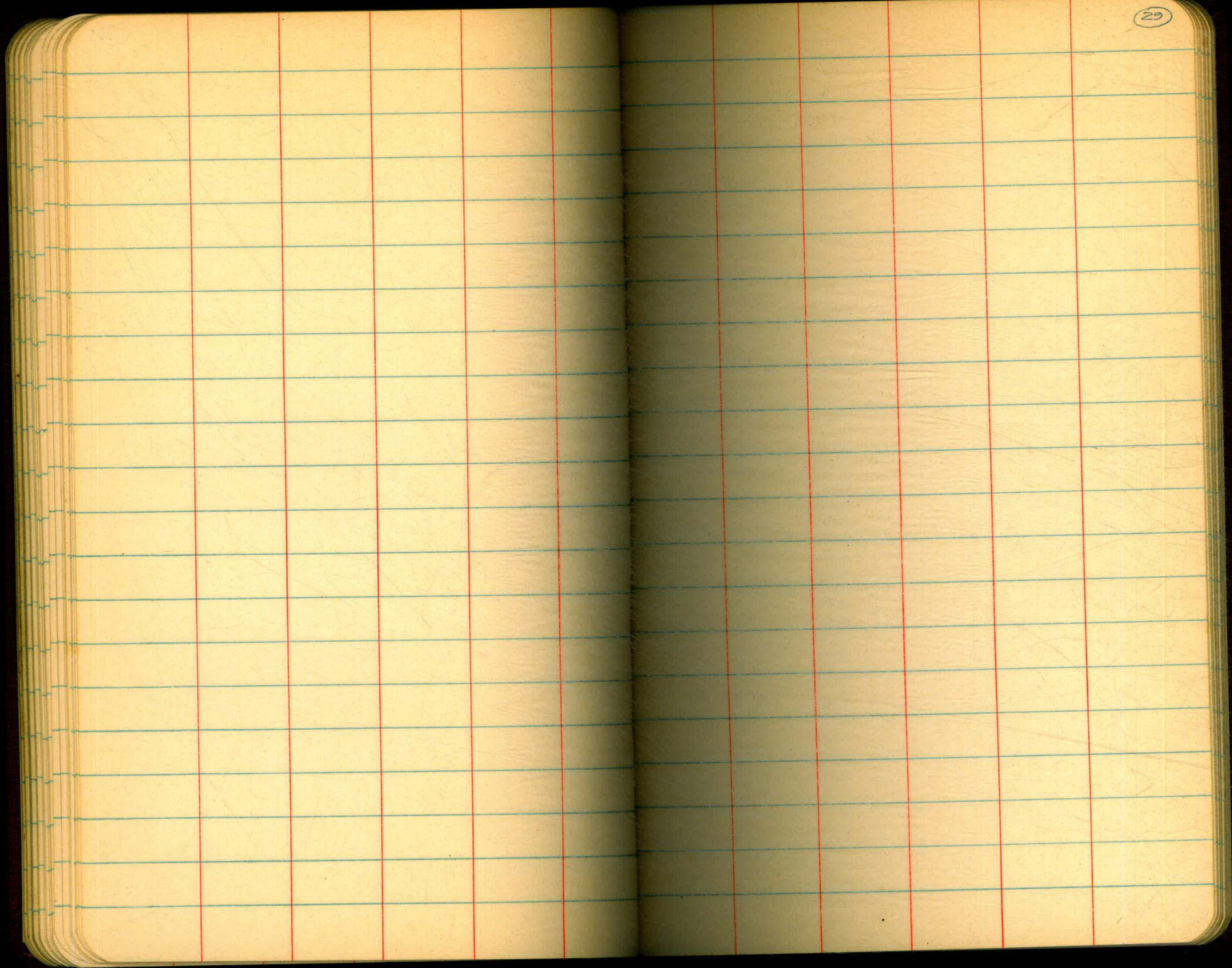


The image shows an open notebook with two facing pages. Both pages are cream-colored and feature light blue horizontal lines for writing. Vertical red lines create margins on both pages. The right page has a small, hand-drawn circle in the top right corner containing the number '25'. The notebook is set against a dark background.

The image shows an open notebook with two facing pages. Both pages are cream-colored and feature light blue horizontal ruling. Each page has two vertical red margin lines, one on the left and one on the right, creating a central column and two side columns. The pages are otherwise blank. In the top right corner of the right page, the number '26' is handwritten in a small circle. The notebook's binding is visible in the center, and the edges of several other pages are visible on the left side.

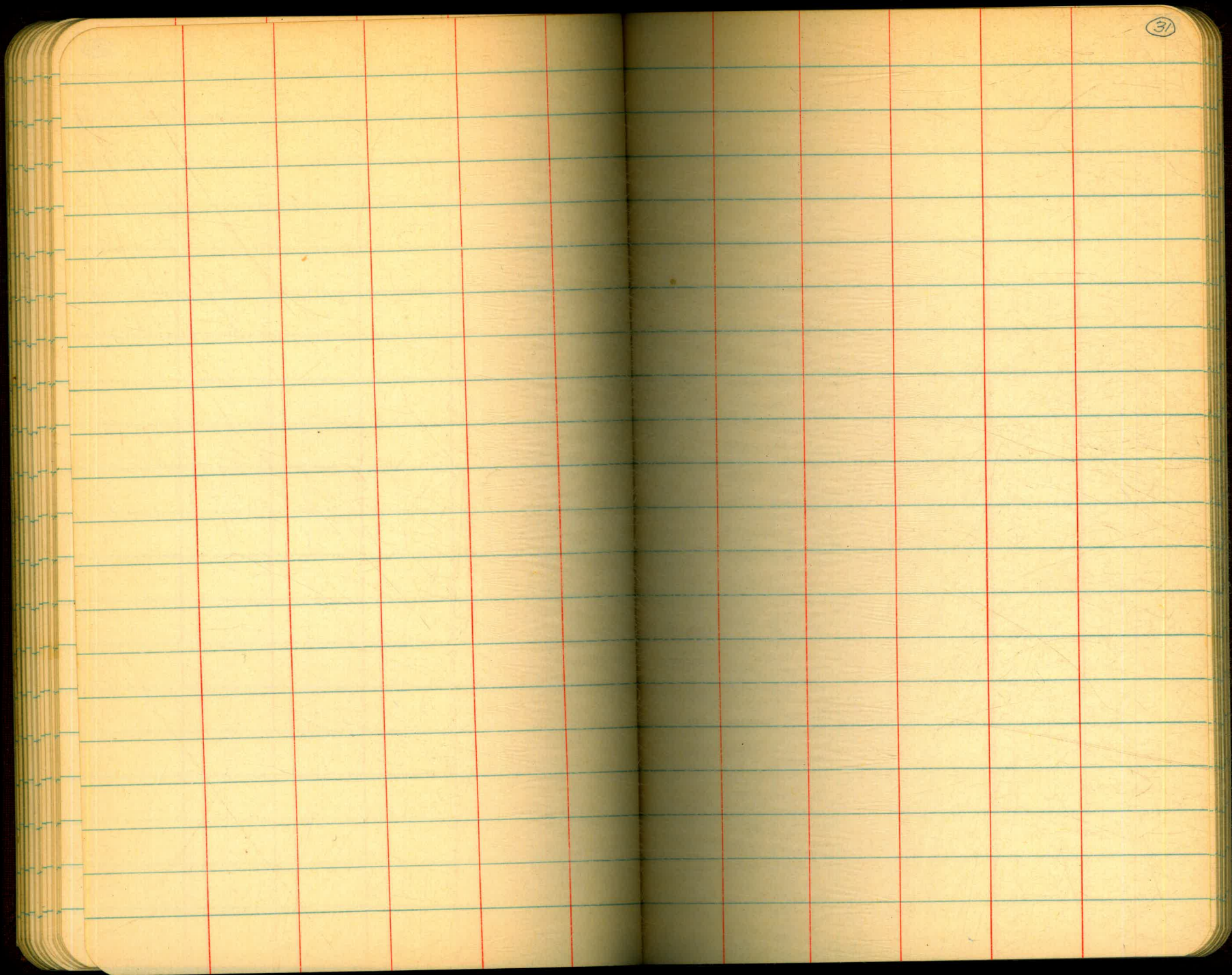


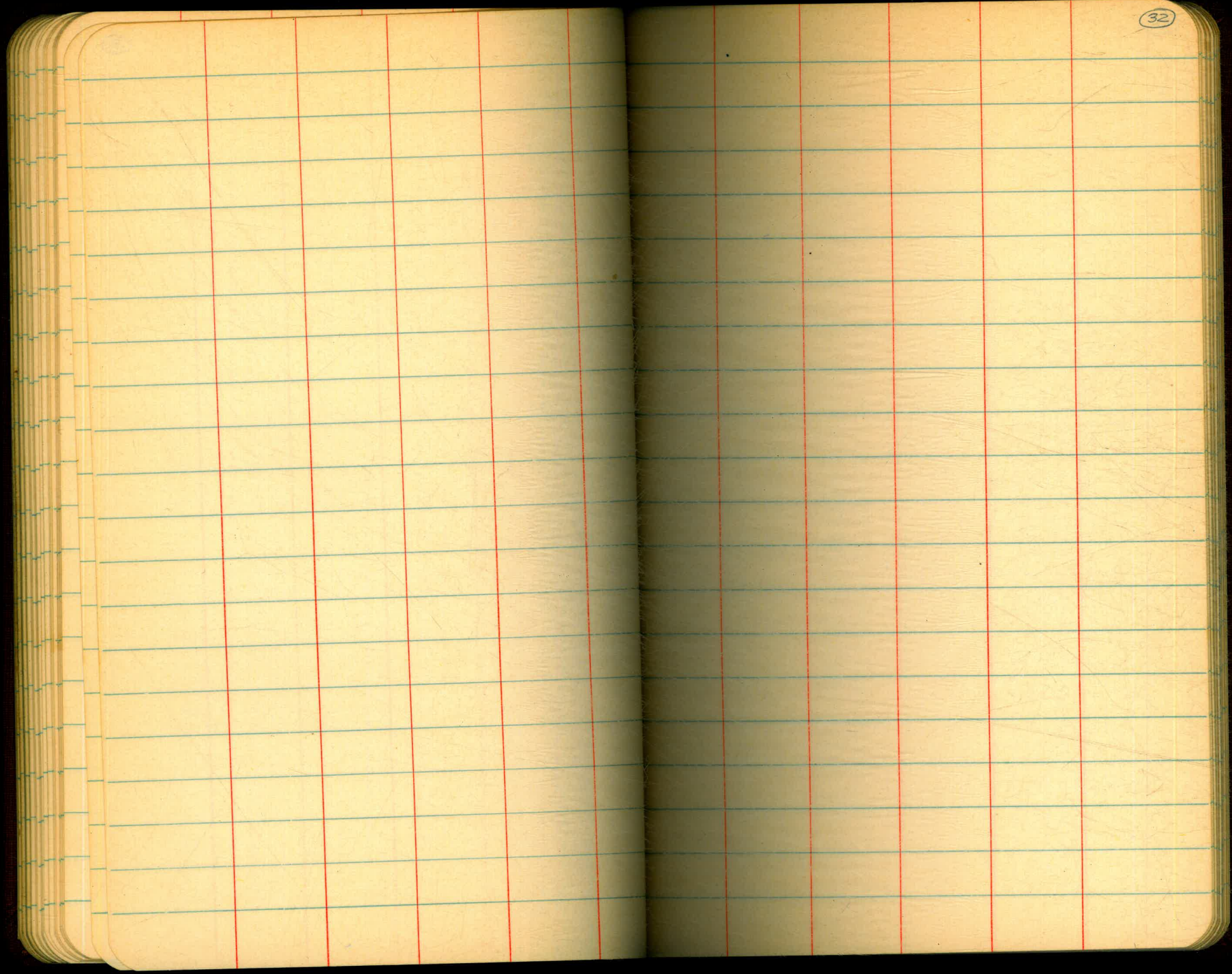






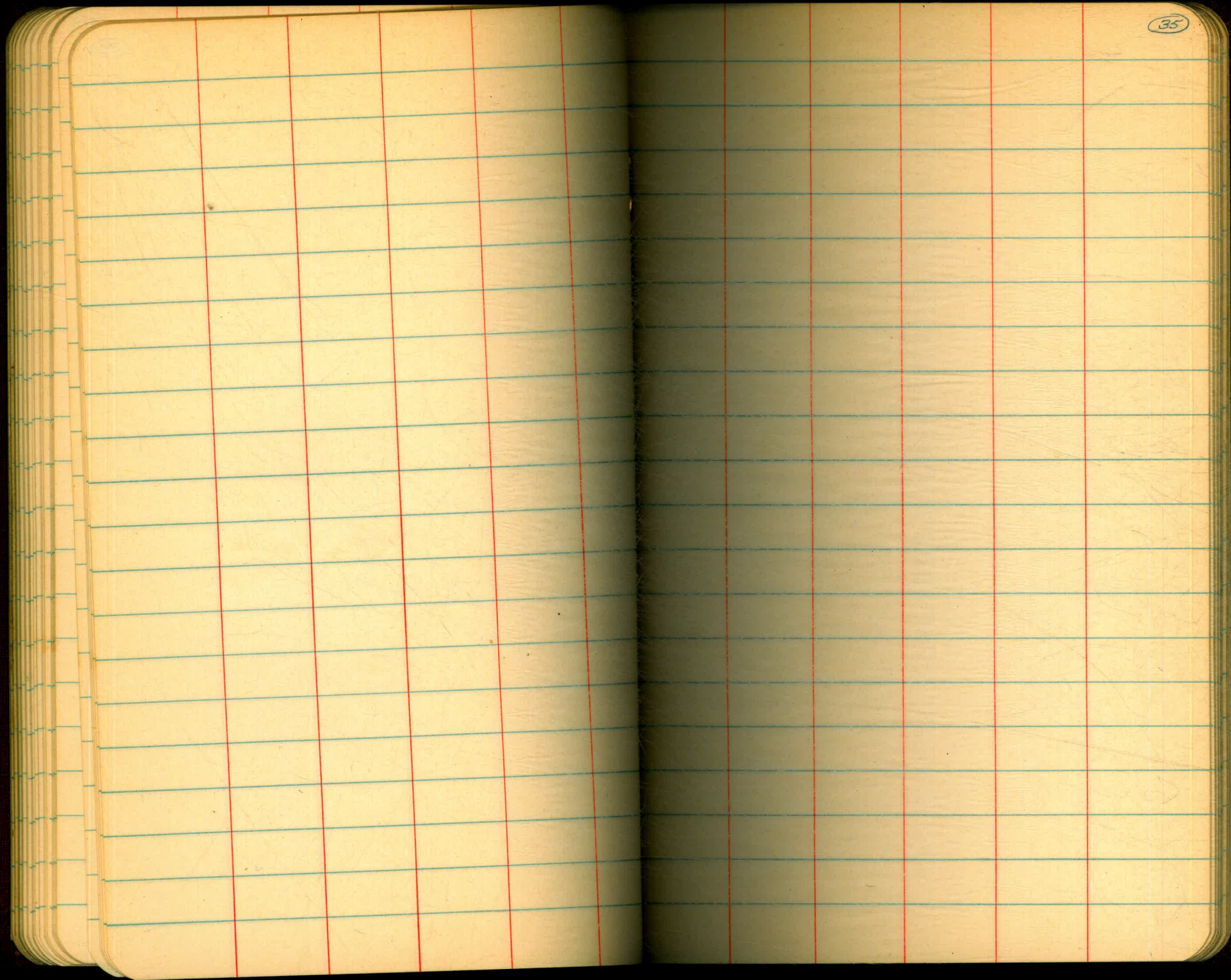
The image shows an open notebook with two facing pages. The pages are cream-colored and feature light blue horizontal ruling. Vertical red lines create margins on both pages. The right page has a small circled number '30' in the top right corner. The notebook is bound in the center, and the pages appear slightly aged or used.

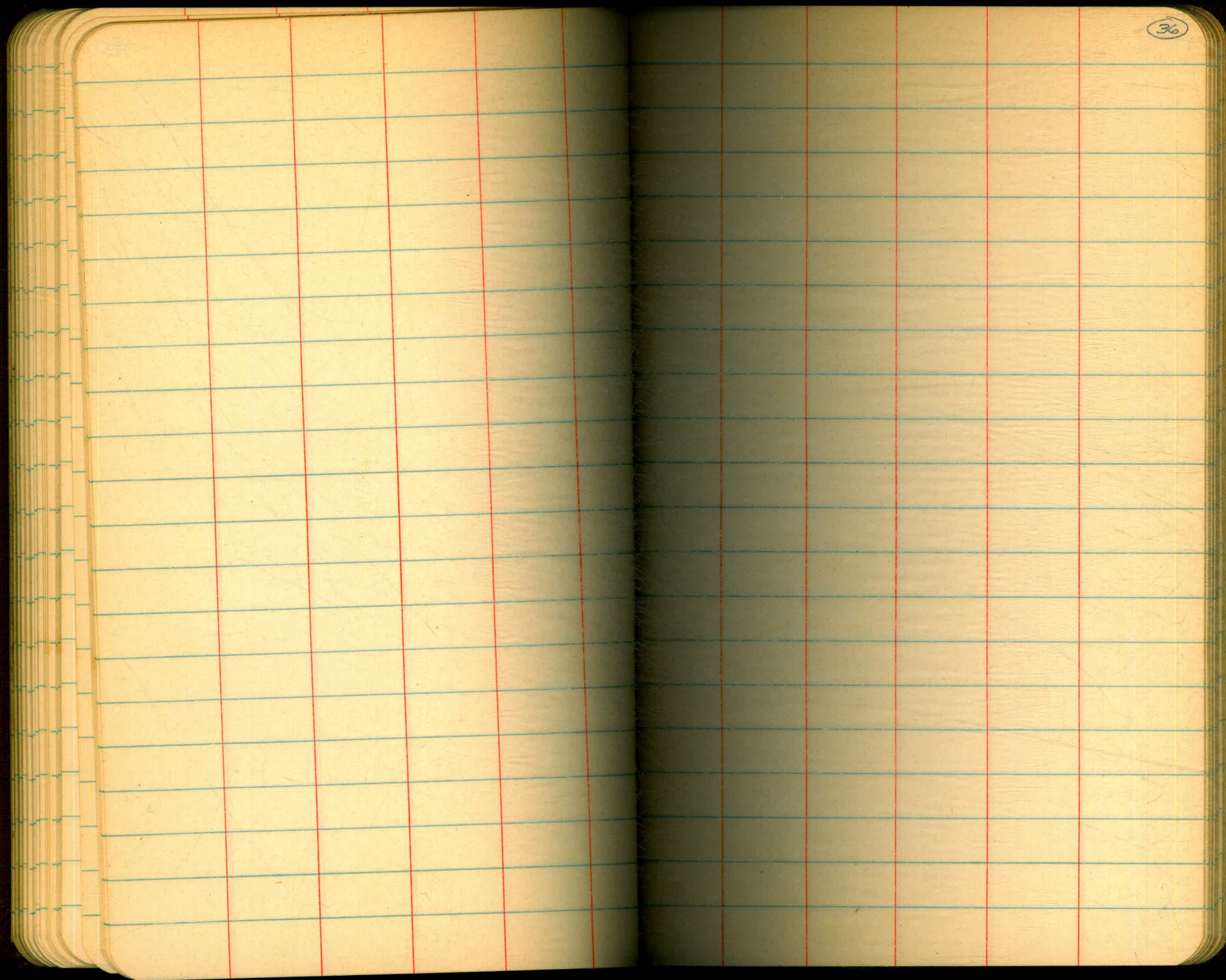










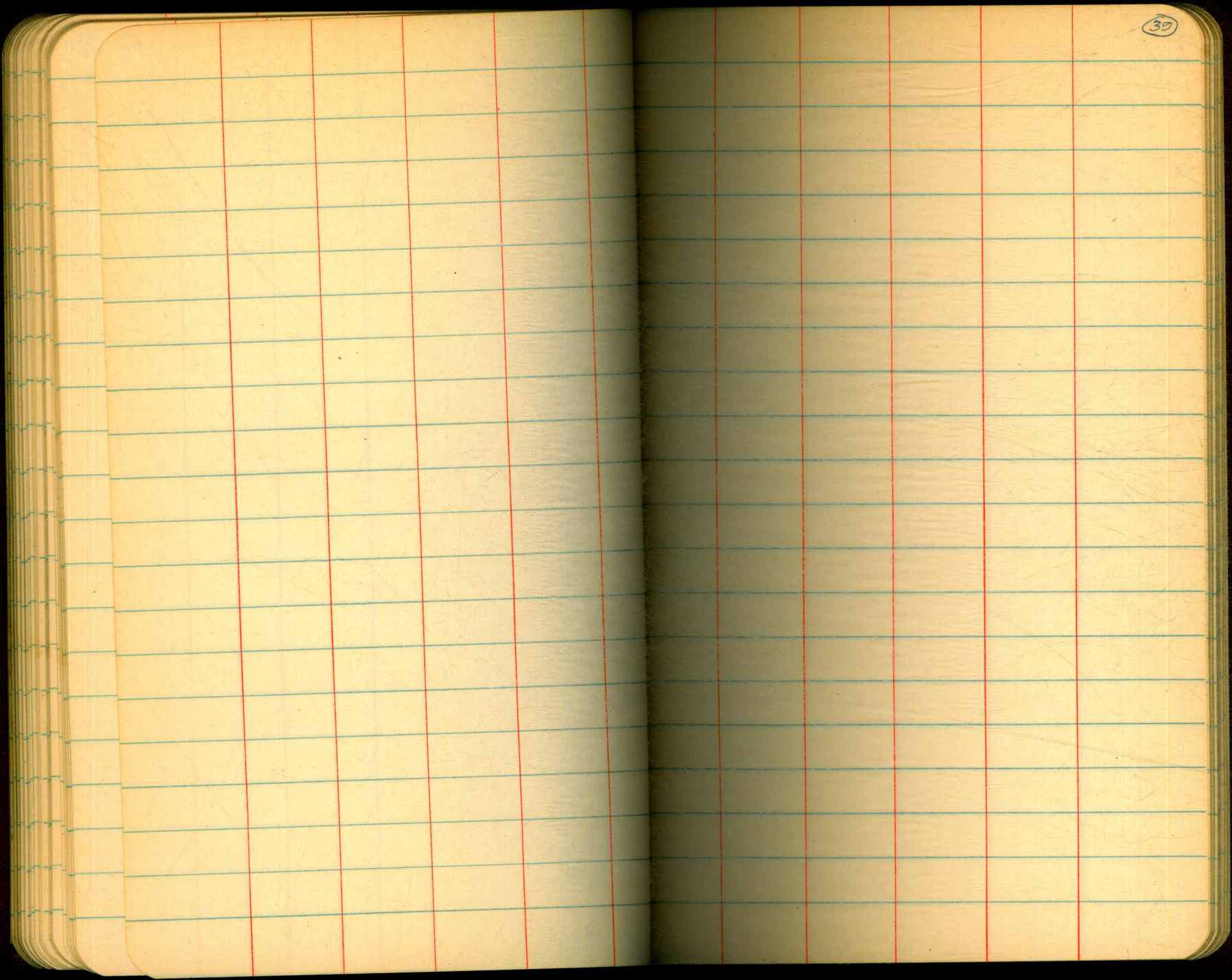


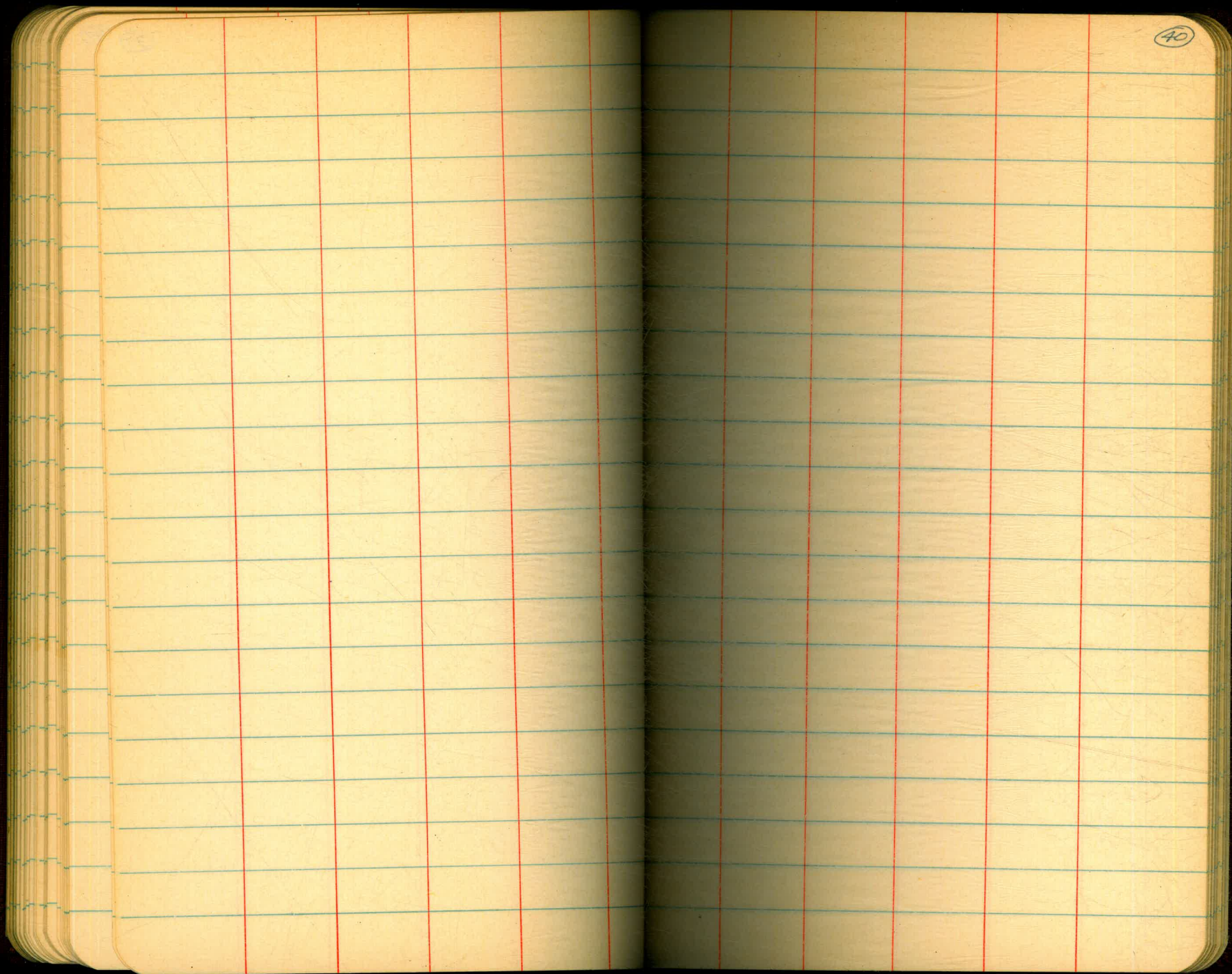
36





The image shows an open notebook with two facing pages. Both pages are cream-colored and feature light blue horizontal ruling. Each page has two vertical red margin lines, one on the left and one on the right, creating a central column and two side columns. The pages are otherwise blank. In the top right corner of the right page, the number '38' is printed inside a small circle. The notebook's binding is visible in the center, and the edges of the pages are slightly rounded.





40



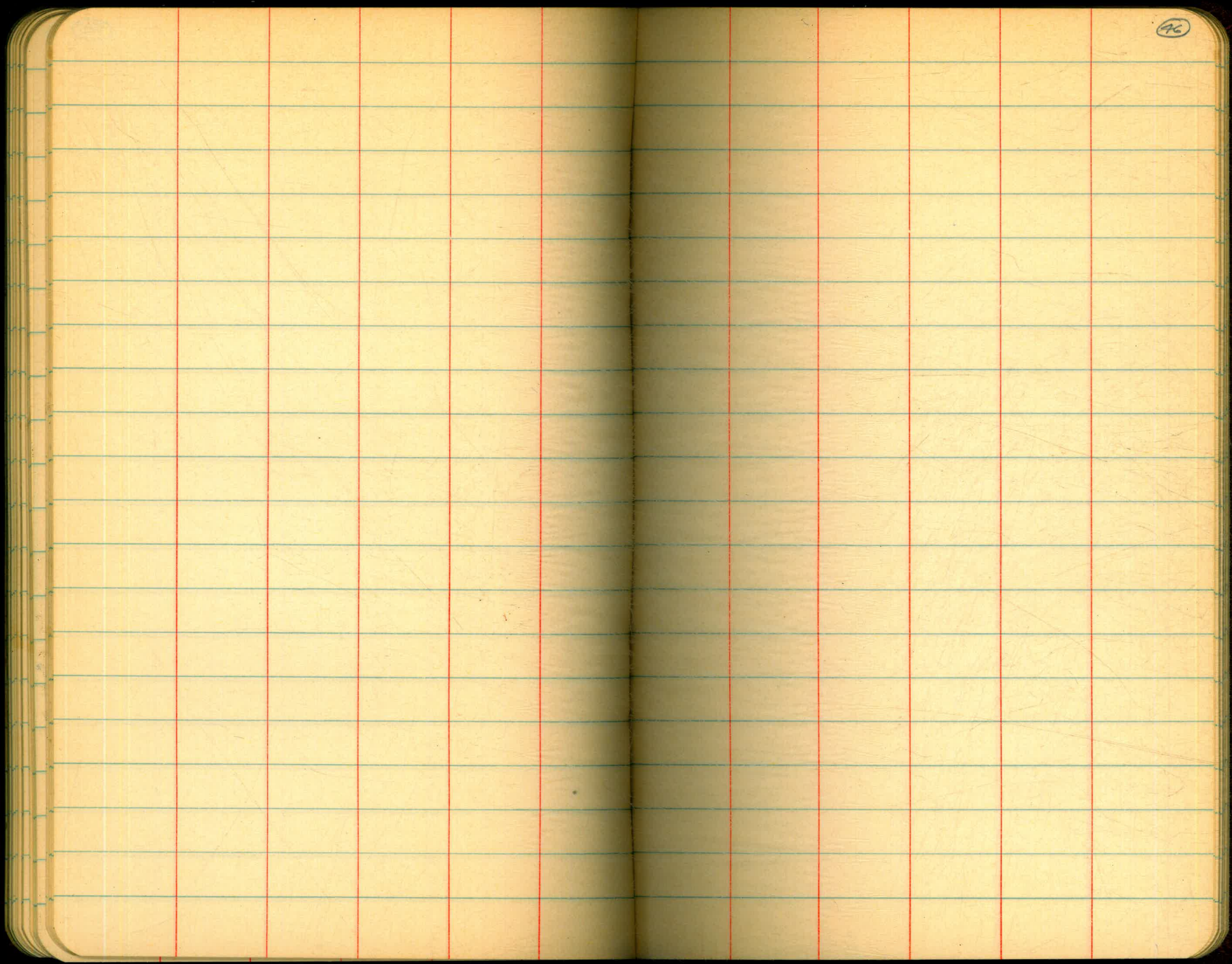


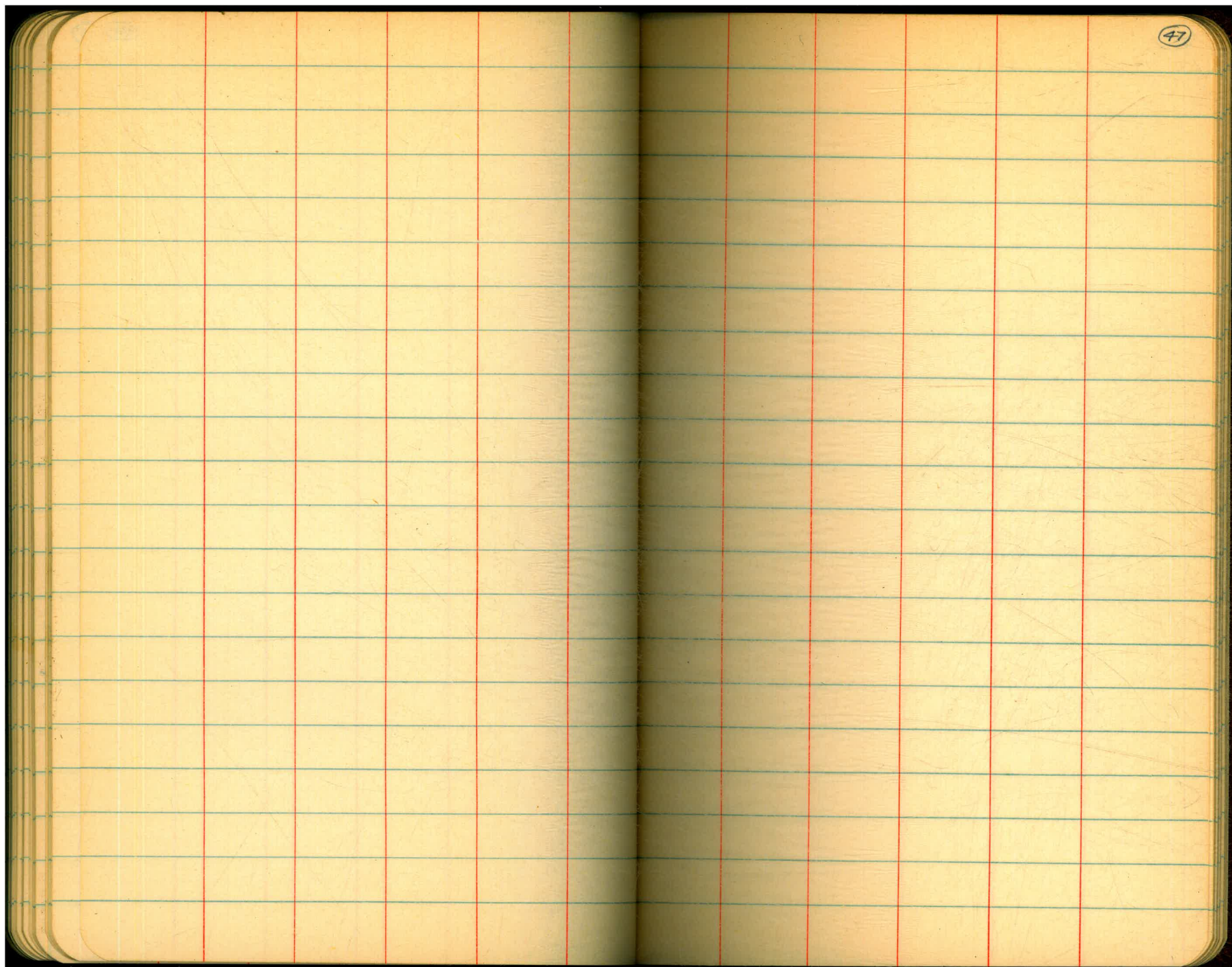












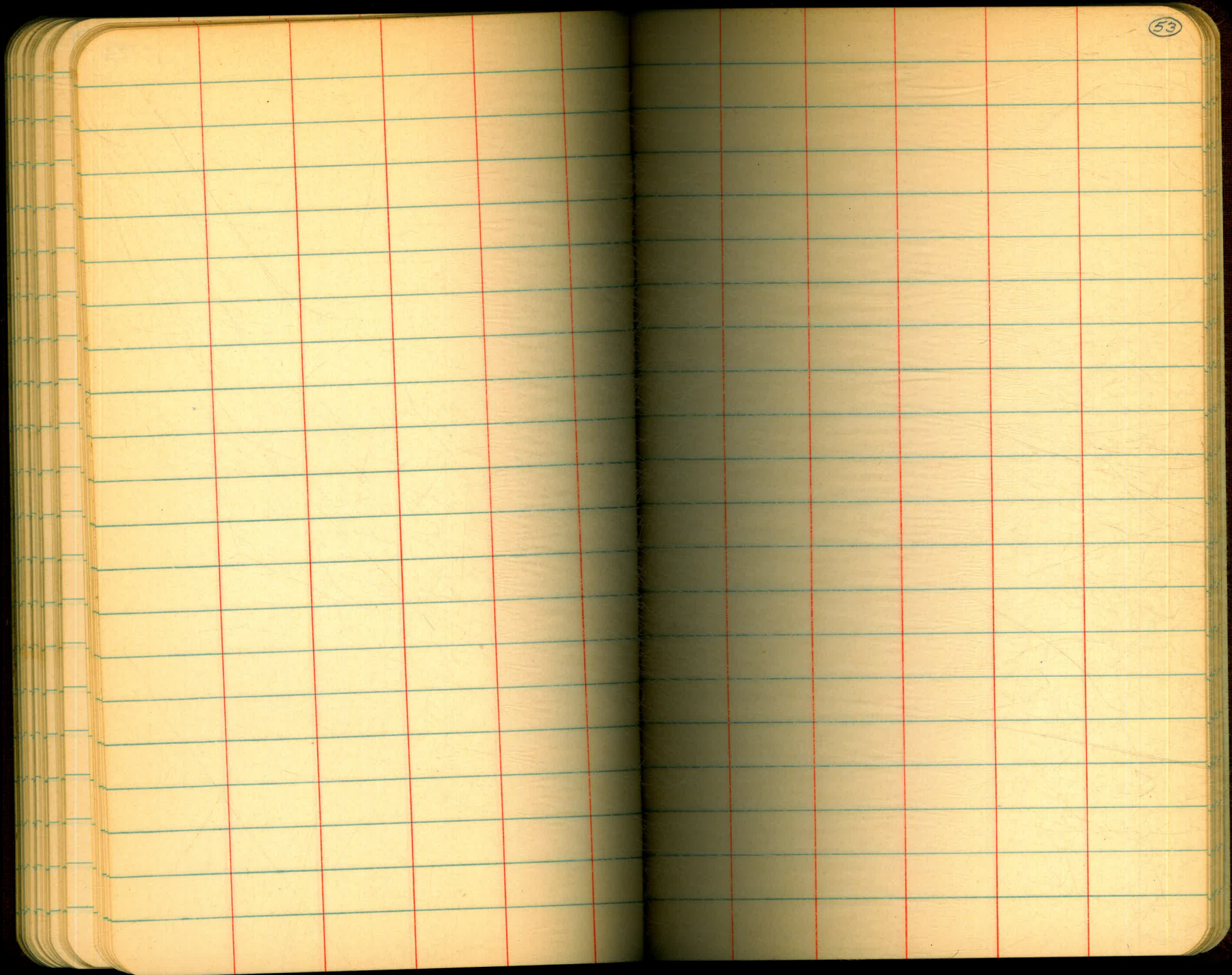
The image shows an open notebook with two facing pages. The pages are cream-colored and feature light blue horizontal ruling. Each page has two vertical red margin lines, one on each side of the central gutter. The right page has a small circled number '48' in the top right corner. The notebook is bound in the center, and the pages are otherwise blank.



The image shows an open notebook with two facing pages. The pages are cream-colored and feature light blue horizontal ruling. Each page has two vertical red margin lines, one on the left and one on the right, creating a central column and two side columns. The notebook has rounded corners and a dark cover is visible around the edges. The pages are blank, with no writing or markings. A small circled number '50' is visible in the top right corner of the right page.



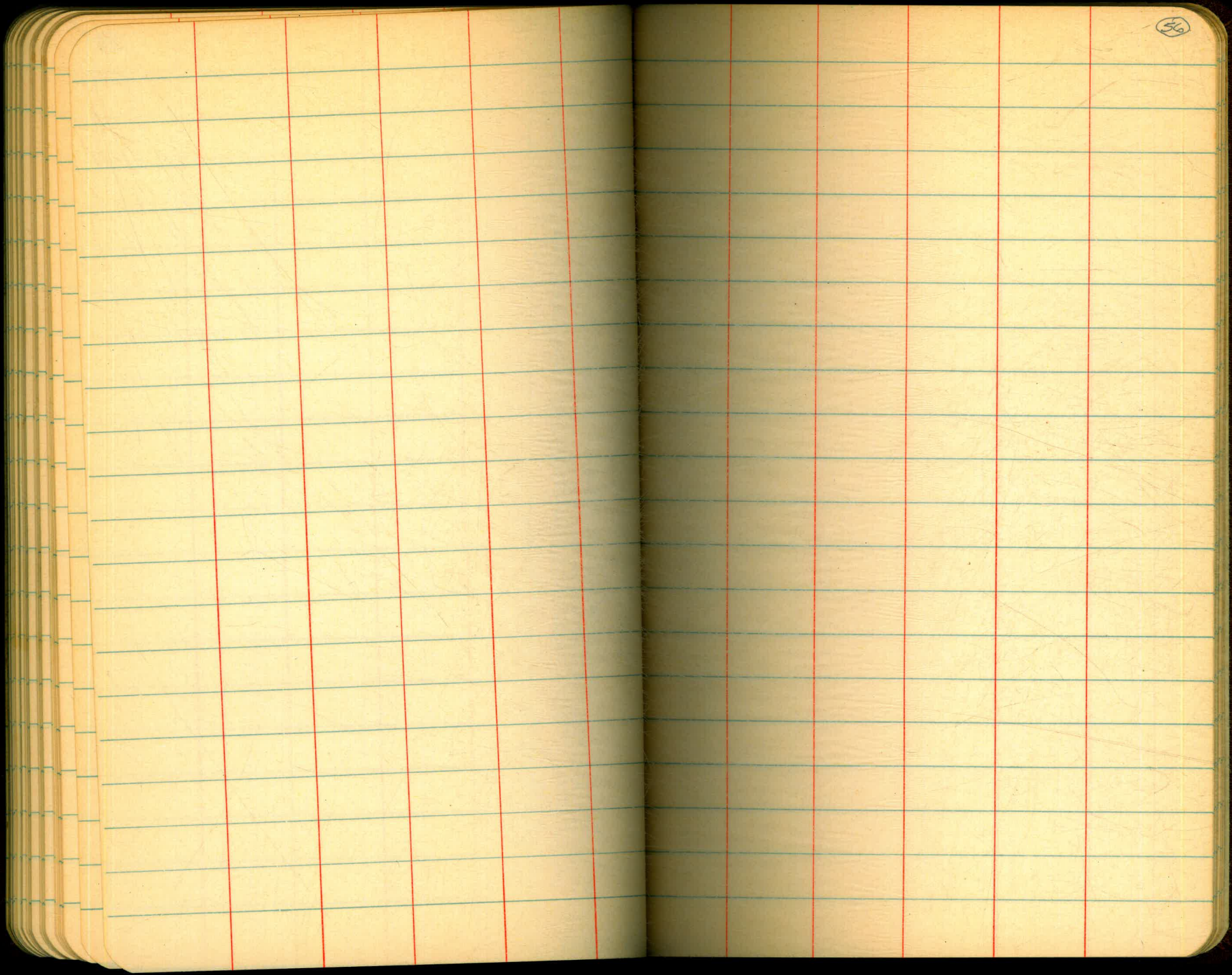
The image shows an open notebook with two facing pages. Both pages are cream-colored and feature light blue horizontal ruling. Each page is divided into two columns by two vertical red margin lines. The right page has the number '52' written in the top right corner. The notebook is bound in the center, and the pages appear slightly aged or used.

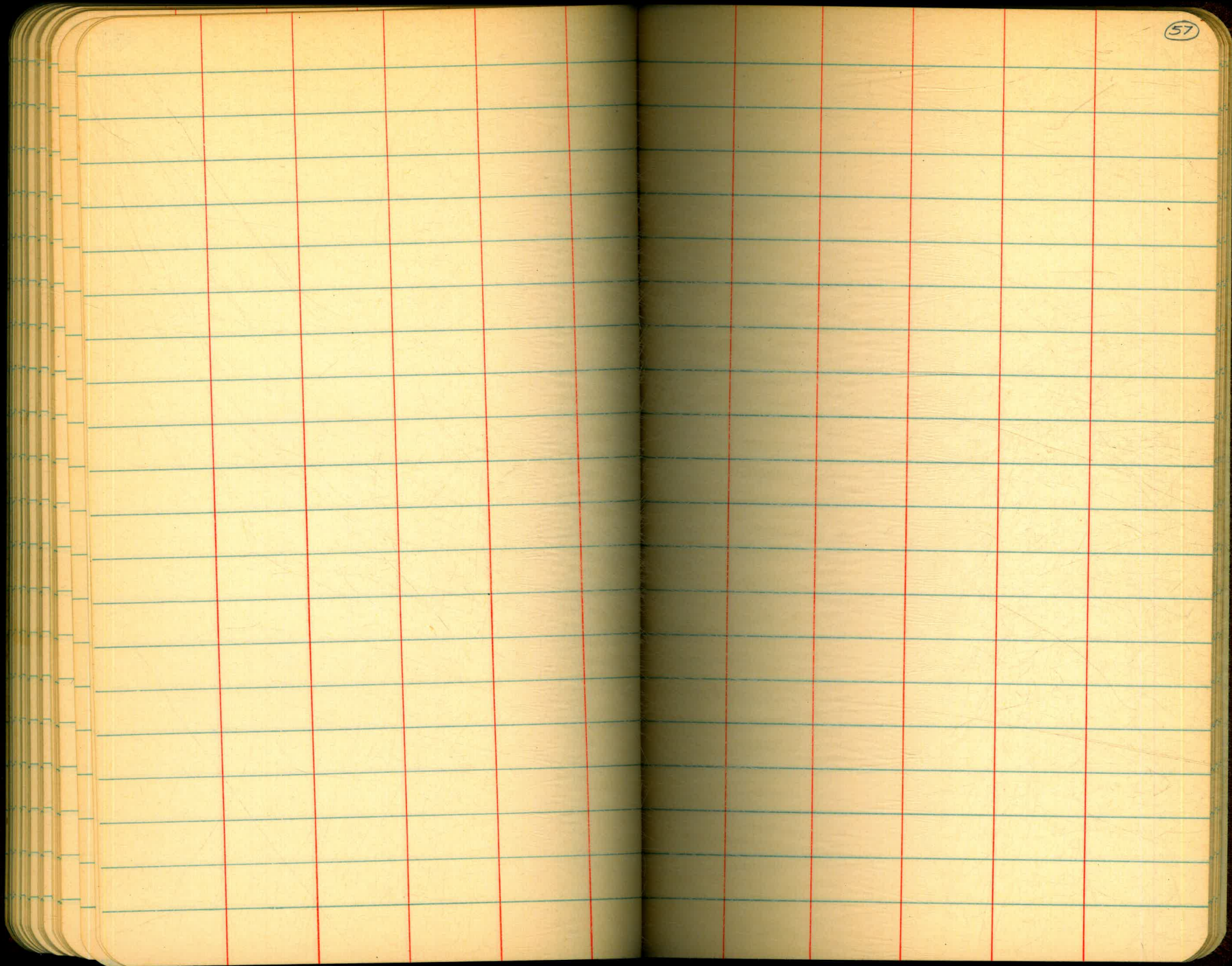


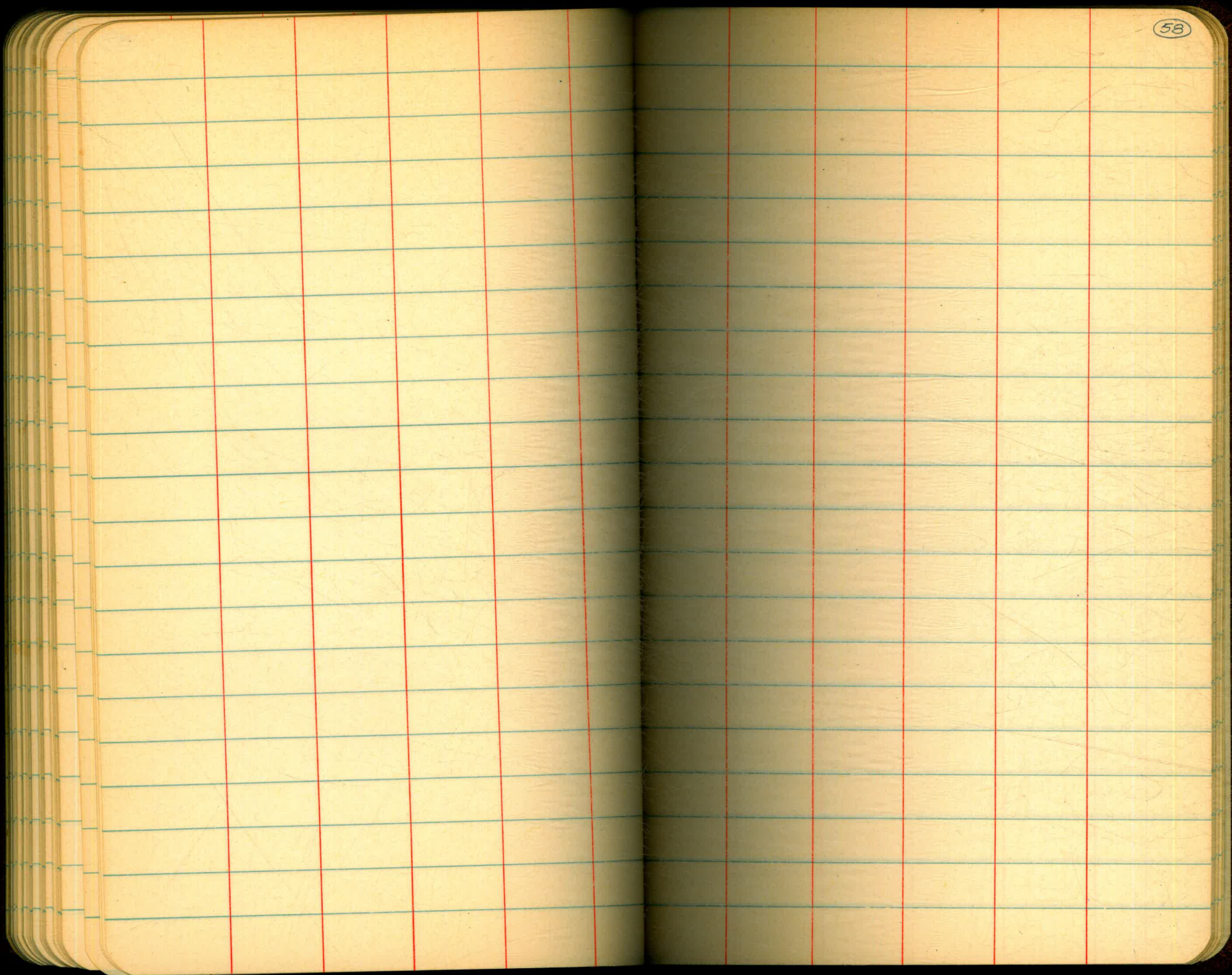


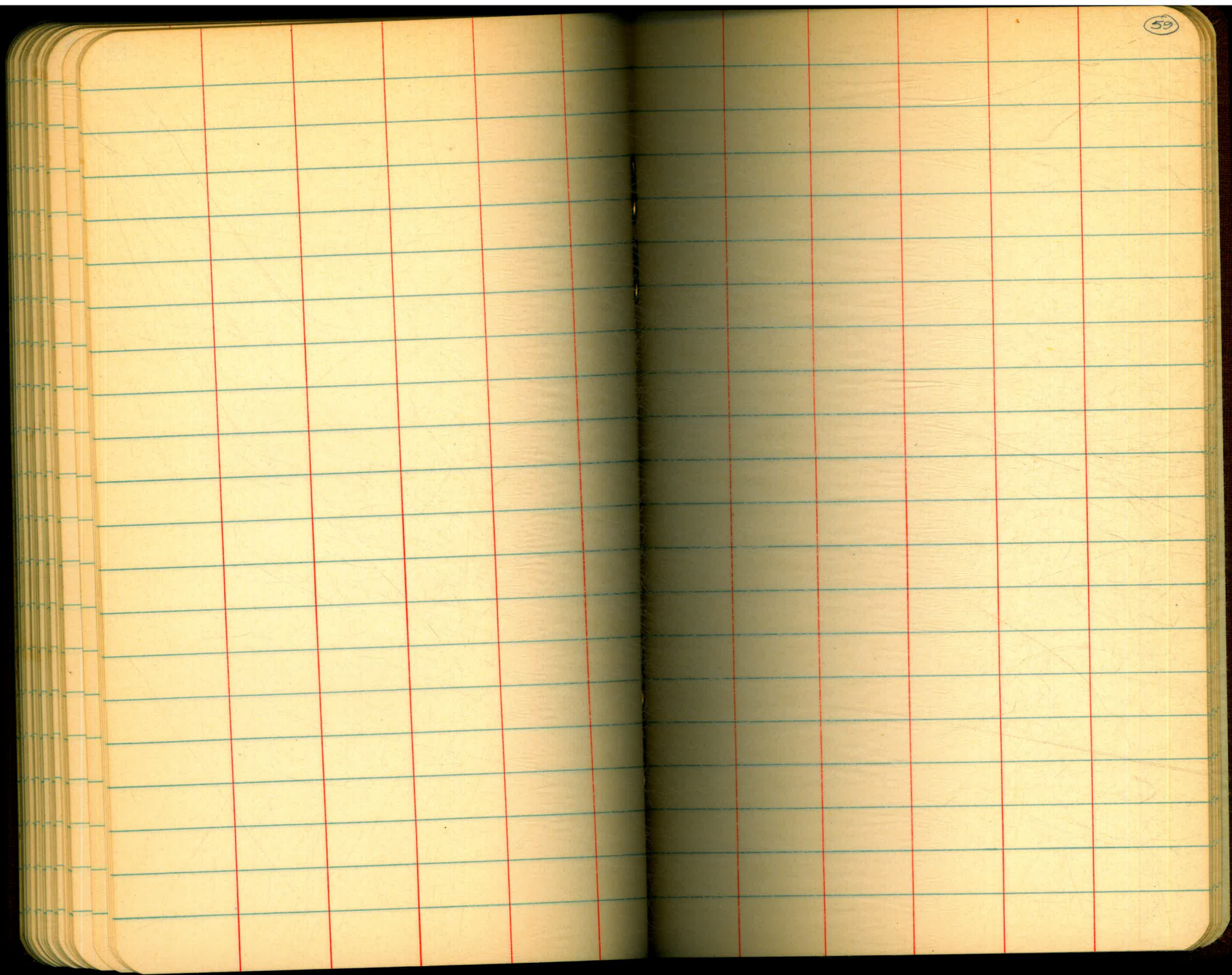
The image shows an open notebook with two facing pages. Both pages are cream-colored and feature light blue horizontal ruling. Vertical red lines create margins on both pages. The right page is numbered '54' in the top right corner. The notebook is bound in the center, and the pages appear slightly aged or used.

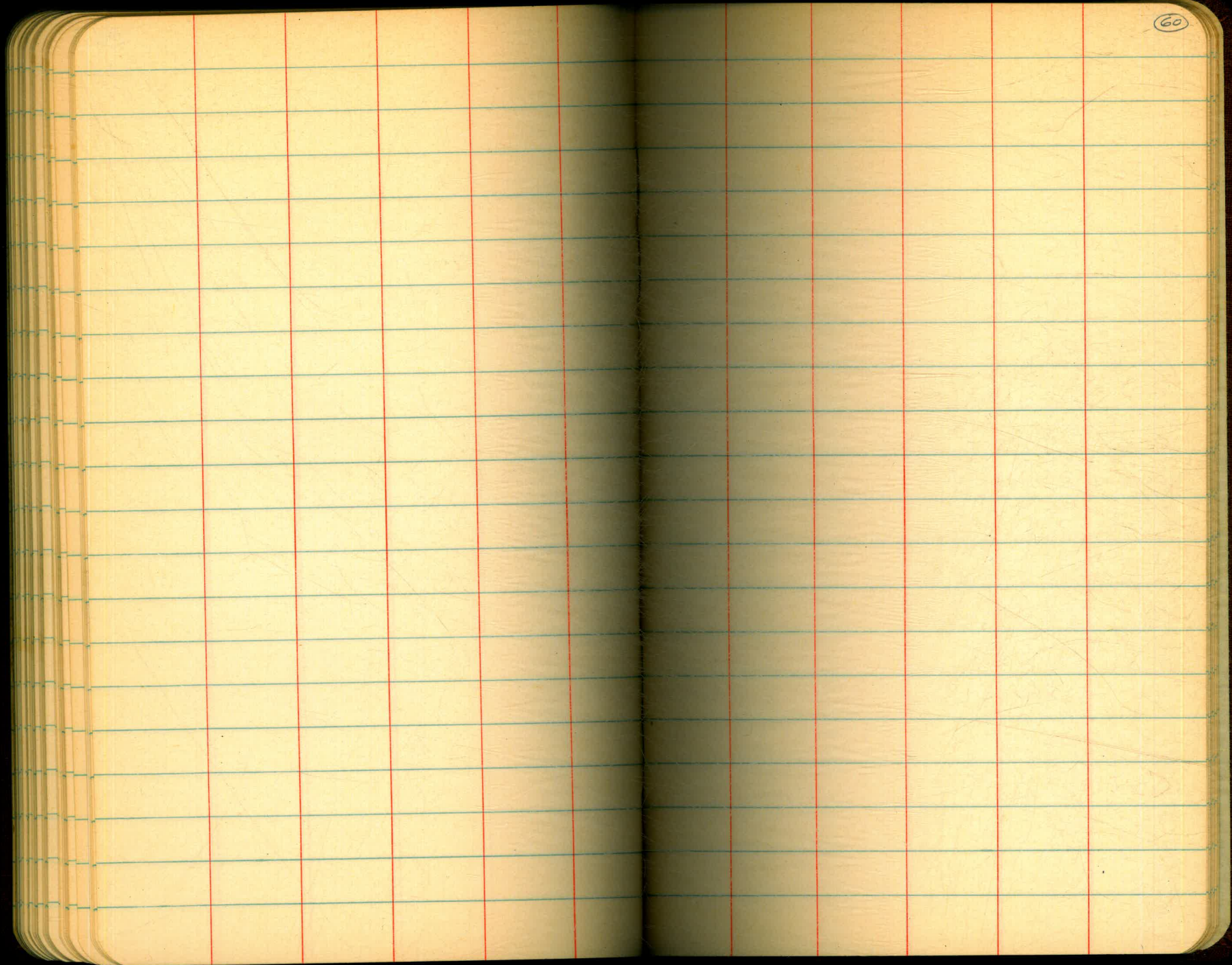
The image shows an open notebook with two facing pages. Both pages are cream-colored and feature a grid of light blue horizontal lines and vertical red margin lines. The right page has the number '55' written in the top right corner. The notebook is bound in the center, and the pages are slightly aged and show some minor wear.

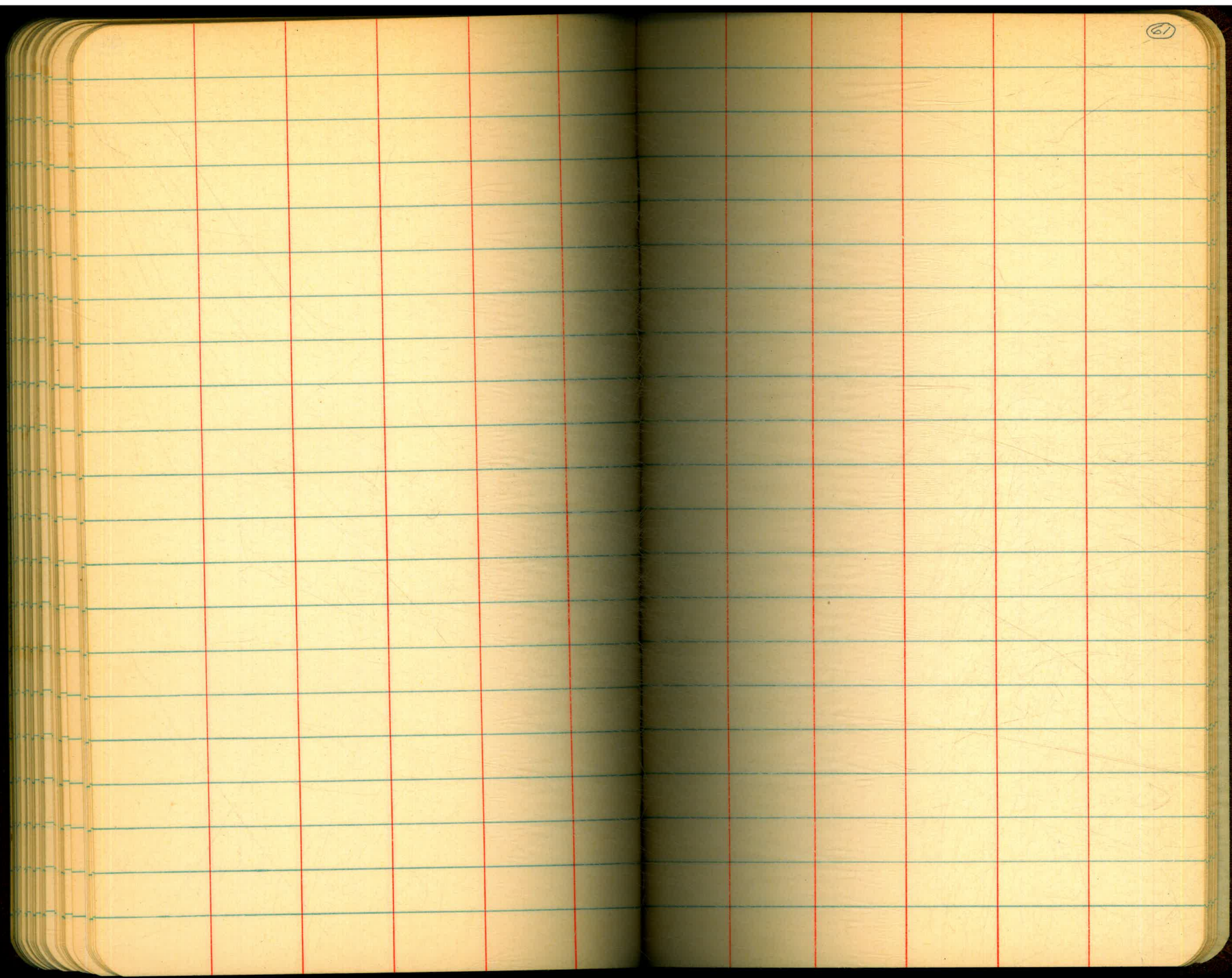












19



The image shows an open notebook with two facing pages. The pages are cream-colored and feature light blue horizontal ruling. Each page has two vertical red margin lines, one on each side of the central gutter. The notebook has rounded corners and a dark cover is visible around the edges. The pages are blank, with no writing or markings other than the page number '62' in the top right corner of the right page.



The image shows an open notebook with two facing pages. The pages are cream-colored and feature light blue horizontal ruling. Each page is divided into two columns by two vertical red margin lines. The notebook has rounded corners and a dark cover is visible around the edges. The pages are blank, with no writing or markings other than the page number '67' in the top right corner of the right page.





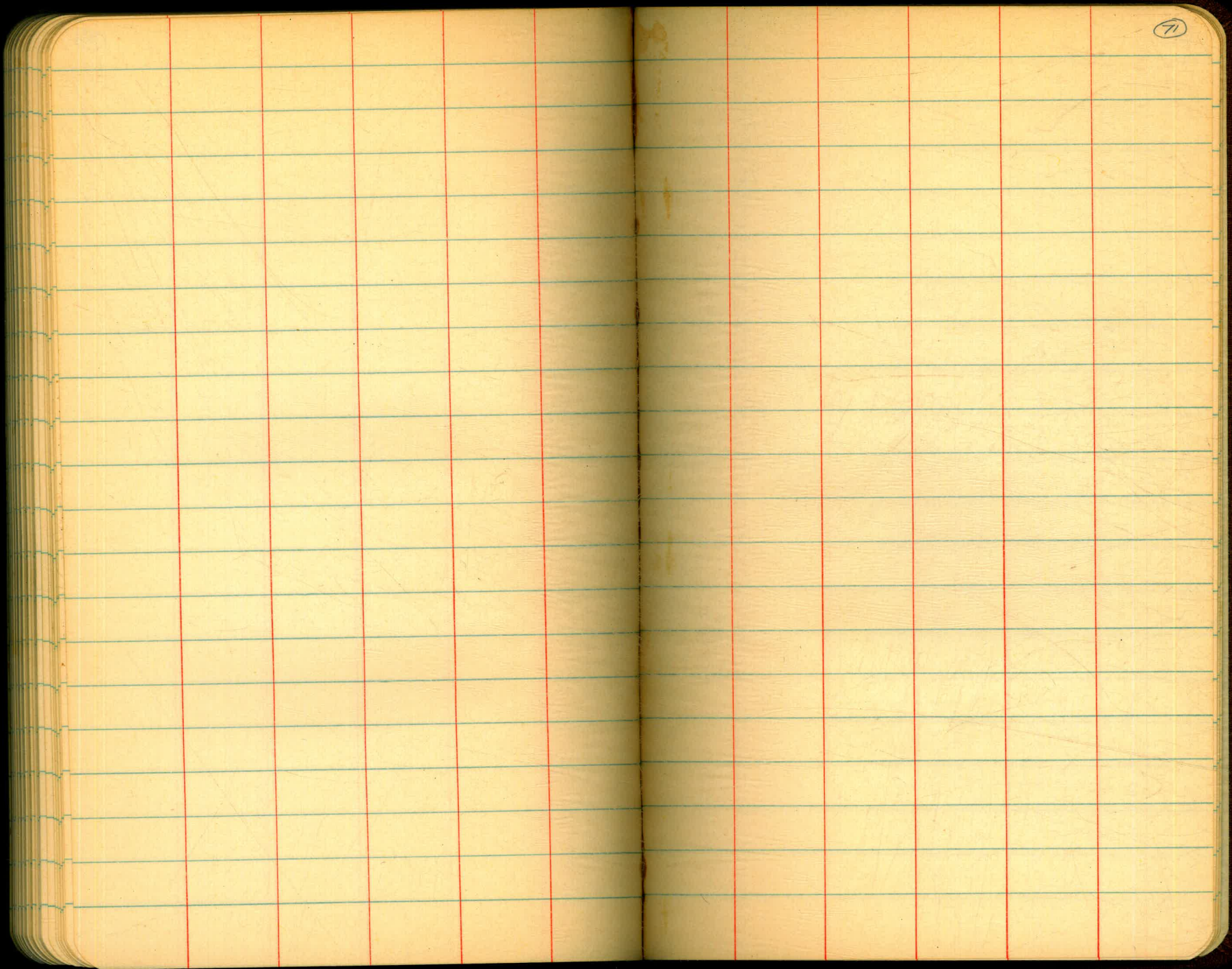




The image shows an open notebook with two facing pages. The pages are cream-colored and feature light blue horizontal ruling. Each page has two vertical red margin lines, one on the left and one on the right, creating a central column and two side columns. The notebook is bound in the center, and the dark cover is visible at the edges. The page number '69' is printed in the top right corner of the right page.















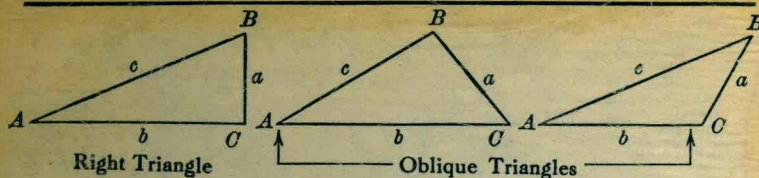








TRIGONOMETRIC FORMULÆ



Right Triangle

Oblique Triangles

Solution of Right Triangles

For Angle A.  $\sin = \frac{a}{c}$ ,  $\cos = \frac{b}{c}$ ,  $\tan = \frac{a}{b}$ ,  $\cot = \frac{b}{a}$ ,  $\sec = \frac{c}{b}$ ,  $\text{cosec} = \frac{c}{a}$

Given	Required	Formulas
$a, b$	$A, B, c$	$\tan A = \frac{a}{b} = \cot B, c = \sqrt{a^2 + b^2} = a \sqrt{1 + \frac{b^2}{a^2}}$
$a, c$	$A, B, b$	$\sin A = \frac{a}{c} = \cos B, b = \sqrt{(c+a)(c-a)} = c \sqrt{1 - \frac{a^2}{c^2}}$
$A, a$	$B, b, c$	$B = 90^\circ - A, b = a \cot A, c = \frac{a}{\sin A}$
$A, b$	$B, a, c$	$B = 90^\circ - A, a = b \tan A, c = \frac{b}{\cos A}$
$A, c$	$B, a, b$	$B = 90^\circ - A, a = c \sin A, b = c \cos A$

Solution of Oblique Triangles

Given	Required	Formulas
$A, B, a$	$b, c, C$	$b = \frac{a \sin B}{\sin A}, C = 180^\circ - (A + B), c = \frac{a \sin C}{\sin A}$
$A, a, b$	$B, c, C$	$\sin B = \frac{b \sin A}{a}, C = 180^\circ - (A + B), c = \frac{a \sin C}{\sin A}$
$a, b, C$	$A, B, c$	$A + B = 180^\circ - C, \tan \frac{1}{2}(A - B) = \frac{(a - b) \tan \frac{1}{2}(A + B)}{a + b}$ $c = \frac{a \sin C}{\sin A}$
$a, b, c$	$A, B, C$	$s = \frac{a + b + c}{2}, \sin \frac{1}{2}A = \sqrt{\frac{(s - b)(s - c)}{bc}}$ $\sin \frac{1}{2}B = \sqrt{\frac{(s - a)(s - c)}{ac}}, C = 180^\circ - (A + B)$
$a, b, c$	Area	$s = \frac{a + b + c}{2}, \text{area} = \sqrt{s(s - a)(s - b)(s - c)}$
$A, b, c$	Area	$\text{area} = \frac{bc \sin A}{2}$
$A, B, C, a$	Area	$\text{area} = \frac{a^2 \sin B \sin C}{2 \sin A}$

REDUCTION TO HORIZONTAL



Horizontal distance = Slope distance multiplied by the cosine of the vertical angle. Thus: slope distance = 319.4 ft. Vert. angle =  $5^\circ 10'$ . From Table, Page IX.  $\cos 5^\circ 10' = .9959$ . Horizontal distance =  $319.4 \times .9959 = 318.09$  ft.

Horizontal distance also = Slope distance minus slope distance times (1 - cosine of vertical angle). With the same figures as in the preceding example, the following result is obtained.  $\text{Cosine } 5^\circ 10' = .9959, 1 - .9959 = .0041, 319.4 \times .0041 = 1.31, 319.4 - 1.31 = 318.09$  ft.

When the rise is known, the horizontal distance is approximately:—the slope distance less the square of the rise divided by twice the slope distance. Thus: rise = 14 ft., slope distance = 302.6 ft. Horizontal distance =  $302.6 - \frac{14 \times 14}{2 \times 302.6} = 302.6 - 0.32 = 302.28$  ft.