

INDEX TABLES (Numerical Divisions)

For Standard Dividing Head Plate and Wide Range Divider

(See pages 18 and 19 for method of calculating angular spacings and divisions not listed for the Wide Range Divider)

Table of divisions obtainable with the standard Index Plate and the large plate of the Wide Range Divider, used with Dividing Heads, Gear Cutting Attachments, Spiral Milling Heads and Plain Centers.

The plates are drilled on both sides with circles of holes equally spaced. The number of holes in the circles are as follows:

Standard Dividing Head Plate	First Side—24-25-28-30-34-37-38-39-41-42-43
	Second Side—46-47-49-51-53-54-57-58-59-62-66
Large Plate of Wide Range Divider	First Side—24-28-30-34-37-38-39-41-42-43-100
	Second Side—46-47-49-51-53-54-57-58-59-62-66

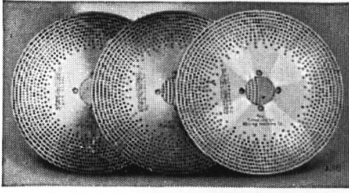
No. of Divisions	Circle	Turns	Spaces	No. of Divisions	Circle	Turns	Spaces	No. of Divisions	Circle	Spaces	No. of Divisions	Circle	Spaces	No. of Divisions	Circle	Spaces	No. of Divisions	Circle	Spaces
2	Any	20	....	37	37	1	3	80	24	12	148	37	10	248	62	10	460	46	4
3	24	13	8	38	38	1	2	82	41	20	150	30	8	250	25	4	464	58	5
4	Any	10	....	39	39	1	1	84	42	20	152	38	10	255	51	8	470	47	4
5	Any	8	....	40	Any	1	....	85	34	16	155	62	16	260	39	6	472	59	5
6	24	6	16	41	41	....	40	86	43	20	156	39	10	264	66	10	480	24	2
7	28	5	20	42	42	....	40	88	66	30	160	28	7	270	54	8	490	49	4
8	Any	5	....	43	43	....	40	90	54	24	164	41	10	272	34	5	496	62	5
9	54	4	24	44	66	....	60	92	46	20	165	66	16	280	28	4	500	25	2
10	Any	4	....	45	54	....	48	94	47	20	168	42	10	290	58	8	510	51	4
11	66	3	42	46	46	....	40	95	38	16	170	34	8	296	37	5	520	39	3
12	24	3	8	47	47	....	40	96	24	10	172	43	10	300	30	4	528	66	5
13	39	3	3	48	24	....	20	98	49	20	176	66	15	304	38	5	530	53	4
14	49	2	42	49	49	....	40	100	25	10	180	54	12	310	62	8	540	54	4
15	24	2	16	50	25	....	20	102	51	20	184	46	10	312	39	5	560	28	2
16	24	2	12	51	51	....	40	104	39	15	185	37	8	320	24	3	570	57	4
17	34	2	12	52	39	....	30	105	42	16	188	47	10	328	41	5	580	58	4
18	54	2	12	53	53	....	40	106	53	20	190	38	8	330	66	8	590	59	4
19	38	2	4	54	54	....	40	108	54	20	192	24	5	336	42	5	600	30	2
20	Any	2	....	55	66	....	48	110	66	24	195	39	8	340	34	4	620	62	4
21	42	1	38	56	28	....	20	112	28	10	196	49	10	344	43	5	660	66	4
22	66	1	54	57	57	....	40	114	57	20	200	30	6	360	54	6	680	34	2
23	46	1	34	58	58	....	40	115	46	16	204	51	10	368	46	5	720	54	3
24	24	1	16	59	59	....	40	116	58	20	205	41	8	370	37	4	740	37	2
25	25	1	15	60	24	....	16	118	59	20	210	42	8	376	47	5	760	38	2
26	39	1	21	62	62	....	40	120	24	8	212	53	10	380	38	4	780	39	2
27	54	1	26	64	24	....	15	124	62	20	215	43	8	390	39	4	820	41	2
28	42	1	18	65	39	....	24	125	25	8	216	54	10	392	49	5	840	42	2
29	58	1	22	66	66	....	40	130	39	12	220	66	12	400	30	3	860	43	2
30	24	1	8	68	34	....	20	132	66	20	224	28	5	408	51	5	880	66	3
31	62	1	18	70	28	....	16	135	54	16	228	57	10	410	41	4	920	46	2
32	28	1	7	72	54	....	30	136	34	10	230	46	8	420	42	4	940	47	2
33	66	1	14	74	37	....	20	140	28	8	232	58	10	424	53	5	960	24	1
34	34	1	6	75	30	....	16	144	54	15	235	47	8	430	43	4	980	49	2
35	28	1	4	76	38	....	20	145	58	16	236	59	10	432	54	5	1000	25	1
36	54	1	6	78	39	....	20				240	24	4	440	66	6			
											245	49	8	456	57	5			

INDEX TABLE (Numerical Divisions) FOR HIGH NUMBER INDEXING ATTACHMENT

Indexes all numbers up to and including 200; all even numbers and those divisible by 5 up to and including 400, except 225, 275, 325, 375.

This attachment consists of a set of 3 index plates which are drilled on six sides, A, B, C, D, E and F. Example to index 35 divisions—This division can be made from side F, D, A or E. The preferred side is F, since this requires the least number of holes. But should either D, A or E be in place, it can be used, thus avoiding the bother of changing plates.

No. of Div.	Side	Circle	Turns	Spaces	No. of Div.	Side	Circle	Turns	Spaces	No. of Div.	Side	Circle	Spaces	No. of Div.	Side	Circle	Spaces
2	Any	Any	20	...	19	F	38	2	4	41	C	123	120	70	D	42	24
3	A	30	13	10	19	E	133	2	14	42	E	42	40	70	A	91	52
3	B	36	13	12	19	A	171	2	18	42	A	147	140	70	E	119	68
3	E	42	13	14	20	Any	Any	2	...	43	A	129	120	71	F	71	40
3	C	93	13	31	21	E	42	1	38	44	D	44	40	72	B	36	20
3	F	159	13	53	21	A	147	1	133	44	A	99	90	72	A	117	65
4	Any	Any	10	...	22	D	44	1	36	44	F	143	130	72	C	153	85
5	Any	Any	8	...	22	A	99	1	81	45	B	36	32	73	E	73	40
6	A	30	6	20	22	F	143	1	117	45	A	99	88	74	B	111	60
6	B	36	6	24	23	C	46	1	34	45	C	153	136	75	A	30	16
6	E	42	6	28	23	A	69	1	51	46	C	46	40	76	F	38	20
6	C	93	6	62	23	E	161	1	119	46	A	69	60	76	E	133	70
6	F	159	6	106	24	A	30	1	20	46	E	161	140	76	A	171	90
7	F	28	5	20	24	B	36	1	24	47	B	141	120	77	D	77	40
7	E	42	5	30	24	E	42	1	28	48	A	30	25	78	A	117	60
7	D	77	5	55	24	C	93	1	62	48	B	36	30	79	C	79	40
7	A	91	5	65	24	F	159	1	106	49	A	147	120	80	E	26	13
8	Any	Any	5	...	25	A	30	1	18	50	A	30	24	80	F	28	14
9	B	36	4	16	25	E	175	1	105	50	E	175	140	80	A	30	15
9	A	99	4	44	26	E	26	1	14	51	C	153	120	80	D	32	16
9	C	153	4	68	26	A	91	1	49	52	E	26	20	80	C	34	17
10	Any	Any	4	...	26	B	169	1	91	52	A	91	70	80	B	36	18
11	D	44	3	28	27	B	81	1	39	52	F	143	110	80	E	42	21
11	A	99	3	63	27	A	189	1	91	52	B	169	130	81	B	81	40
11	F	143	3	91	28	F	28	1	12	53	F	159	120	82	C	123	60
12	A	30	3	10	28	E	42	1	18	54	B	81	60	83	F	83	40
12	B	36	3	12	28	D	77	1	33	54	A	189	140	84	E	42	20
12	E	42	3	14	28	A	91	1	39	55	D	44	32	84	A	147	70
12	C	93	3	31	29	E	87	1	33	55	F	143	104	85	C	34	16
12	F	159	3	53	30	A	30	1	10	56	F	28	20	85	E	119	56
13	E	26	3	2	30	B	36	1	12	56	E	42	30	85	F	187	88
13	A	91	3	7	30	E	42	1	14	56	D	77	55	86	A	129	60
13	F	143	3	11	30	C	93	1	31	56	A	91	65	87	E	87	40
13	B	169	3	13	30	F	159	1	53	57	A	171	120	88	D	44	20
14	F	28	2	24	31	C	93	1	27	58	E	87	60	88	A	99	45
14	E	42	2	36	32	F	28	1	7	59	A	177	120	88	F	143	65
14	D	77	2	66	32	D	32	1	8	60	A	30	20	89	D	89	40
14	A	91	2	78	32	B	36	1	9	60	B	36	24	90	B	36	16
15	A	30	2	20	32	A	48	1	12	60	E	42	28	90	A	99	44
15	B	36	2	24	33	A	99	1	21	60	F	159	106	90	C	153	68
15	E	42	2	28	34	C	34	1	6	61	B	183	120	91	A	91	40
15	C	93	2	62	34	E	119	1	21	62	C	93	60	92	C	46	20
15	F	159	2	106	34	F	187	1	33	63	A	189	120	92	A	69	30
16	E	26	2	13	35	F	28	1	4	64	D	32	20	92	E	161	70
16	F	28	2	14	35	D	77	1	11	64	A	48	30	93	C	93	40
16	A	30	2	15	35	A	91	1	13	65	E	26	16	94	B	141	60
16	D	32	2	16	35	E	119	1	17	65	A	91	56	95	F	38	16
16	C	34	2	17	36	B	36	1	4	65	F	143	88	95	E	133	56
16	B	36	2	18	36	A	99	1	11	65	B	169	104	95	A	171	72
17	C	34	2	12	36	C	153	1	17	66	A	99	60	96	B	36	15
17	E	119	2	42	37	B	111	1	9	67	B	67	40	96	A	48	20
17	C	153	2	54	38	F	38	1	2	68	C	34	20	97	B	97	40
17	F	187	2	66	38	E	133	1	7	68	E	119	70	98	A	147	60
18	B	36	2	8	38	A	171	1	9	68	F	187	110	99	A	99	40
18	A	99	2	22	39	A	117	1	3	69	A	69	40	100	A	30	12
18	C	153	2	34	40	Any	Any	1	...	70	F	28	16	100	E	175	70



INDEX TABLE—(Concluded)

FOR HIGH NUMBER INDEXING ATTACHMENT

Fig. 99A . . . The High Number Indexing Attachment is used by replacing the standard index plate with the High Number plate which will give you the number of divisions required. (See Note Page 71)

No. of Div.	Side	Circle	Spaces	No. of Div.	Side	Circle	Spaces	No. of Div.	Side	Circle	Spaces	No. of Div.	Side	Circle	Spaces	No. of Div.	Side	Circle	Spaces
101	F	101	40	137	D	137	40	180	C	153	34	240	E	42	7	320	A	48	6
102	C	153	60	138	A	69	20	181	C	181	40	240	A	48	8	322	E	161	20
103	E	103	40	139	C	139	40	182	A	91	20	242	D	121	20	324	B	81	10
104	E	26	10	140	F	28	8	183	B	183	40	244	B	183	30	326	D	163	20
104	A	91	35	140	E	42	12	184	C	46	10	245	A	147	24	328	C	123	15
104	F	143	55	140	D	77	22	184	A	69	15	246	C	123	20	330	A	99	12
104	B	169	65	140	A	91	26	184	E	161	35	248	C	93	15	332	F	83	10
105	E	42	16	141	B	141	40	185	B	111	24	250	E	175	28	334	C	167	20
105	A	147	56	142	F	71	20	186	C	93	20	252	A	189	30	336	B	67	8
106	F	159	60	143	F	143	40	187	F	187	40	254	B	127	20	336	E	42	5
107	D	107	40	144	B	36	10	188	B	141	30	255	C	153	24	338	B	169	20
108	B	81	30	145	E	87	24	189	A	189	40	256	D	32	5	340	C	34	4
108	A	189	70	146	E	73	20	190	F	38	8	258	A	129	20	340	E	119	14
109	C	109	40	147	A	147	40	190	E	133	28	260	E	26	4	340	F	187	22
110	D	44	16	148	B	111	30	190	A	171	36	260	A	91	14	342	A	171	20
110	A	99	36	149	E	149	40	191	E	191	40	260	F	143	22	344	A	129	15
100	F	143	52	150	A	30	8	192	A	48	10	260	B	169	26	345	A	69	8
111	B	111	40	151	D	151	40	193	D	193	40	262	F	131	20	346	F	173	20
112	F	28	10	152	F	38	10	194	B	97	20	264	A	99	15	348	E	87	10
112	E	42	15	152	E	133	35	195	A	117	24	265	F	159	24	350	E	175	20
113	F	113	40	152	A	171	45	196	A	147	30	266	E	133	20	352	D	44	5
114	A	171	60	153	C	153	40	197	C	197	40	268	B	67	10	354	A	177	20
115	C	46	16	154	D	77	20	198	A	99	20	270	B	81	12	355	F	71	8
115	A	69	24	155	C	93	24	199	B	199	40	270	A	189	28	356	D	89	10
115	E	161	56	156	A	117	30	200	A	30	6	272	C	34	5	358	D	179	20
116	E	87	30	157	B	157	40	200	E	175	35	274	D	137	20	360	B	36	4
117	A	117	40	158	C	79	20	202	F	101	20	276	A	69	10	360	A	99	11
118	A	177	60	159	F	159	40	204	C	153	30	278	C	139	20	360	C	153	17
119	E	119	40	160	F	28	7	205	C	123	24	280	F	28	4	362	C	181	20
120	A	30	10	160	D	32	8	206	E	103	20	280	E	42	6	364	A	91	10
120	B	36	12	160	B	36	9	208	E	26	5	280	D	77	11	365	E	73	8
120	E	42	14	160	A	48	12	210	E	42	8	280	A	91	13	366	B	183	20
120	C	93	31	161	E	161	40	210	A	147	28	282	B	141	20	368	C	46	5
120	F	159	53	162	B	81	20	212	F	159	30	284	F	71	10	370	B	111	12
121	D	121	40	163	D	163	40	214	D	107	20	235	A	171	24	372	C	93	10
122	B	183	60	164	C	123	30	215	A	129	24	286	F	143	20	374	F	187	20
123	C	123	40	165	A	99	24	216	B	81	15	288	B	36	5	376	B	141	15
124	C	93	30	166	F	83	20	216	A	189	35	290	E	87	12	378	A	189	20
125	E	175	56	167	C	167	40	218	C	109	20	292	E	73	10	380	F	38	4
126	A	189	60	168	E	42	10	220	D	44	8	294	A	147	20	380	E	133	14
127	B	127	40	168	A	147	35	220	A	99	18	295	A	177	24	380	A	171	18
128	D	32	10	169	B	169	40	220	F	143	26	296	B	111	15	382	E	191	20
128	A	48	15	170	C	34	8	222	B	111	20	298	E	149	20	384	A	48	5
129	A	129	40	170	E	119	28	224	F	28	5	300	A	30	4	385	D	77	8
130	E	26	8	170	F	187	44	226	F	113	20	302	D	151	20	386	D	193	20
130	A	91	28	171	A	171	40	228	A	171	30	304	F	38	5	388	B	97	10
130	F	143	44	172	A	129	30	230	C	46	8	305	B	183	24	390	A	117	12
130	B	169	52	173	F	173	40	230	A	69	12	306	C	153	20	392	A	147	15
131	F	131	40	174	E	87	20	230	E	161	28	308	D	77	10	394	C	197	20
132	A	99	30	175	E	175	40	232	E	87	15	310	C	93	12	395	C	79	8
133	E	133	40	176	D	44	10	234	A	117	20	312	A	117	15	396	A	99	10
134	B	67	20	177	A	177	40	235	B	141	24	314	B	157	20	398	B	199	20
135	B	81	24	178	D	89	20	236	A	177	30	315	A	189	24	400	A	30	3
135	A	189	56	179	D	179	40	238	E	119	20	316	C	79	10	.....	.....	.....	.....
136	C	34	10	180	B	36	8	240	A	30	5	318	F	159	20	.....	.....	.....	.....
136	E	119	35	180	A	99	22	240	B	36	6	320	D	32	4	.....	.....	.....	.....

TABLE OF ANGULAR DIVISIONS
Obtainable With Standard Dividing Head and Wide Range Divider
(Use 54-hole circle on large plate)

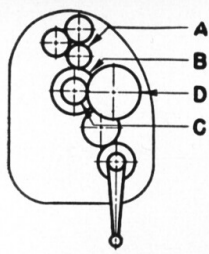
DEGREES											
Degrees	Turns of Crank B	Spaces Crank B	Degrees	Turns of Crank B	Spaces Crank B	Degrees	Turns of Crank B	Spaces Crank B	Degrees	Turns of Crank B	Spaces Crank B
1	9	41	81	6	30	121	13	24	161	17	48
2	12	42	82	9	36	122	13	30	162	18	6
3	18	43	83	6	42	123	13	36	163	6	12
4	24	44	84	9	48	124	13	42	164	18	18
5	30	45	85	9	54	125	13	48	165	18	24
6	36	46	86	9	60	126	14	54	166	18	30
7	42	47	87	6	66	127	14	60	167	18	36
8	48	48	88	9	72	128	14	66	168	30	42
9	54	49	89	9	78	129	14	72	169	36	48
10	60	50	90	10	84	130	14	78	170	42	54
11	66	51	91	10	90	131	14	84	171	48	60
12	72	52	92	10	96	132	14	90	172	6	66
13	78	53	93	10	102	133	14	96	173	12	72
14	84	54	94	10	108	134	14	102	174	18	78
15	90	55	95	10	114	135	15	108	175	24	84
16	96	56	96	10	120	136	15	114	176	30	90
17	102	57	97	10	126	137	15	120	177	36	96
18	108	58	98	11	132	138	15	126	178	42	102
19	114	59	99	11	138	139	15	132	179	48	108
20	120	60	100	11	144	140	15	138	180	6	114
21	126	61	101	11	150	141	15	144	181	12	120
22	132	62	102	11	156	142	15	150	182	18	126
23	138	63	103	11	162	143	15	156	183	24	132
24	144	64	104	11	168	144	16	162	184	30	138
25	150	65	105	11	174	145	16	168	185	36	144
26	156	66	106	11	180	146	16	174	186	42	150
27	162	67	107	11	186	147	16	180	187	48	156
28	168	68	108	12	192	148	16	186	188	6	162
29	174	69	109	12	198	149	16	192	189	12	168
30	180	70	110	12	204	150	16	198	190	18	174
31	186	71	111	12	210	151	16	204	191	24	180
32	192	72	112	12	216	152	16	210	192	30	186
33	198	73	113	12	222	153	17	216	193	36	192
34	204	74	114	12	228	154	17	222	194	42	198
35	210	75	115	12	234	155	17	228	195	48	204
36	216	76	116	12	240	156	17	234	196	6	210
37	222	77	117	13	246	157	17	240	197	12	216
38	228	78	118	13	252	158	17	246	198	18	222
39	234	79	119	13	258	159	17	252	199	24	228
40	240	80	120	13	264	160	17	258	200	30	234

(Use 54-hole circle on small plate)

FRACTIONS OF A DEGREE

[illegible]

NOTE.—When indexing degrees and fractions of a degree, Cranks "B" and "D" in above tables (indicated in Figure 71A, page 71) are both moved in the same direction


TABLE OF LEADS (2.500 to 3.800)

Lead of Spiral in Inches	A	B	C	D	Lead of Spiral in Inches	A	B	C	D	Lead of Spiral in Inches	A	B	C	D
2.500	27	45	20	48	2.923	19	39	27	45	3.385	22	39	27	45
2.507	22	39	20	45	2.927	19	51	33	42	3.389	22	42	33	51
2.510	24	45	24	51	2.930	20	39	24	42	3.394	21	33	24	45
2.513	19	36	20	42	2.941	24	51	30	48	3.399	39	45	20	51
2.516	21	36	22	51	2.946	22	42	27	48	3.409	27	33	20	48
2.521	20	42	27	51	2.956	21	30	19	45	3.415	33	36	19	51
2.530	17	42	30	48	2.966	22	51	33	48	3.422	24	33	24	51
2.534	21	39	24	51	2.976	20	48	30	42	3.429	24	42	27	45
2.540	20	42	24	45	2.986	22	39	27	51	3.437	27	36	22	48
2.546	22	36	20	48	2.991	20	36	21	39	3.440	22	27	19	45
2.552	22	39	19	42	2.995	21	33	24	51	3.451	24	30	22	51
2.561	19	51	33	48	3.000	21	55	33	42	3.457	21	27	20	45
2.567	24	33	18	51	3.009	22	45	24	39	3.462	27	39	24	48
2.574	21	48	30	51	3.017	20	51	30	39	3.472	30	36	20	48
2.579	19	39	27	51	3.025	24	42	27	51	3.480	30	39	19	42
2.588	22	51	27	45	3.029	21	39	27	48	3.486	24	27	20	51
2.593	21	36	20	45	3.039	18	55	39	42	3.492	30	42	22	45
2.598	24	39	19	45	3.048	24	42	24	45	3.500	36	45	21	48
2.608	21	30	19	51	3.056	22	45	30	48	3.505	39	48	22	51
2.614	20	51	30	45	3.068	27	33	18	48	3.516	24	39	24	42
2.619	22	42	24	48	3.077	20	39	27	45	3.526	30	39	22	48
2.625	21	45	27	48	3.081	22	51	30	42	3.535	21	33	20	36
2.632	21	39	22	45	3.088	21	51	36	48	3.543	24	33	19	39
2.639	19	45	30	48	3.096	22	30	19	45	3.556	24	36	24	45
2.647	24	48	27	51	3.105	30	36	19	51	3.565	30	33	20	51
2.655	22	39	24	51	3.111	24	36	21	45	3.571	30	42	24	48
2.661	19	51	30	42	3.117	24	33	18	42	3.580	27	33	21	48
2.667	24	45	24	48	3.125	21	42	30	48	3.590	42	39	17	51
2.674	21	36	22	48	3.134	20	36	22	39	3.595	30	36	22	51
2.679	20	42	27	48	3.143	22	42	27	45	3.603	21	48	42	51
2.689	24	42	24	51	3.152	19	51	33	39	3.611	39	36	17	51
2.696	22	51	30	48	3.163	22	45	33	51	3.620	30	39	24	51
2.707	20	36	19	39	3.173	27	39	22	48	3.626	27	39	22	42
2.715	20	39	27	51	3.182	24	33	21	48	3.636	24	33	24	48
2.727	21	33	18	42	3.189	19	55	36	39	3.641	39	42	20	51
2.735	24	39	20	45	3.199	20	33	19	36	3.650	33	39	22	51
2.745	24	36	21	51	3.205	20	39	30	48	3.660	24	27	21	51
2.750	22	45	27	48	3.214	24	48	27	42	3.667	24	30	22	48
2.764	19	55	36	45	3.223	22	39	24	42	3.676	39	42	19	48
2.773	22	42	27	51	3.231	27	39	21	45	3.686	22	27	19	42
2.778	20	45	30	48	3.239	27	33	19	48	3.692	27	39	24	45
2.784	24	39	19	42	3.248	19	45	30	39	3.697	33	42	24	51
2.794	22	42	24	45	3.258	27	39	24	51	3.702	33	39	21	48
2.801	20	42	30	51	3.263	21	33	20	39	3.706	27	30	21	51
2.812	21	42	27	48	3.268	30	36	20	51	3.714	39	42	18	45
2.820	22	39	24	48	3.274	22	48	30	42	3.720	19	55	42	39
2.824	24	51	27	45	3.282	24	39	24	45	3.730	24	33	20	39
2.831	21	51	33	48	3.284	21	27	19	45	3.739	22	51	39	45
2.842	19	36	21	39	3.291	21	39	22	36	3.743	30	33	21	51
2.851	21	39	27	51	3.297	20	39	27	42	3.750	18	45	..	48
2.857	24	42	24	48	3.309	27	48	30	51	3.753	24	27	19	45
2.866	19	39	30	51	3.318	22	51	30	39	3.761	30	39	22	45
2.876	22	51	30	45	3.329	17	55	42	39	3.765	24	30	24	51
2.879	24	33	19	48	3.333	21	42	30	45	3.770	30	36	19	42
2.885	20	39	27	48	3.346	21	51	39	48	3.775	33	36	21	51
2.896	24	39	24	51	3.353	27	30	19	51	3.782	30	42	27	51
2.903	19	45	33	48	3.361	22	45	33	48	3.788	30	33	20	48
2.910	20	36	22	42	3.369	27	33	21	51	3.792	39	45	21	48
2.917	21	45	30	48	3.377	20	55	39	42	3.800	27	30	19	45

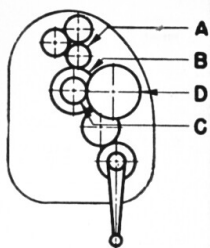


TABLE OF LEADS, STANDARD DRIVING MECHANISM

TABLE OF LEADS (3.810 to 5.025)

Lead of Spiral in Inches	A	B	C	D	Lead of Spiral in Inches	A	B	C	D	Lead of Spiral in Inches	A	B	C	D
3.810	30	42	24	45	4.202	45	42	20	51	4.606	36	33	19	45
3.818	27	33	21	45	4.215	17	55	45	33	4.615	18	42	..	39
3.824	39	42	21	51	4.222	19	42	..	45	4.622	33	42	30	51
3.828	33	39	19	42	4.231	33	39	24	48	4.628	20	55	42	33
3.834	24	27	22	51	4.235	27	30	24	51	4.635	39	33	20	51
3.838	30	33	19	45	4.242	30	33	21	45	4.643	39	42	24	48
3.843	21	51	42	45	4.248	39	36	20	51	4.646	42	39	22	51
3.850	27	33	24	51	4.256	39	42	22	48	4.656	24	27	22	42
3.860	21	51	45	48	4.263	42	39	19	48	4.662	30	33	20	39
3.869	39	42	20	48	4.267	24	30	24	45	4.667	21	39	..	45
3.878	33	39	22	48	4.274	30	36	20	39	4.673	39	36	22	51
3.882	27	30	22	51	4.278	33	36	21	45	4.678	39	33	19	48
3.889	30	36	21	45	4.286	18	45	..	42	4.687	30	36	27	48
3.897	36	39	19	45	4.293	30	33	17	36	4.691	30	27	19	45
3.911	24	30	22	45	4.299	45	39	19	51	4.701	30	36	22	39
3.916	24	33	21	39	4.308	36	39	21	45	4.706	24	36	..	51
3.922	20	48	..	51	4.314	22	45	..	51	4.711	19	55	45	33
3.929	33	42	24	48	4.318	36	33	19	48	4.714	33	42	27	45
3.937	27	30	21	48	4.327	30	39	27	48	4.722	17	42	..	36
3.949	33	39	21	45	4.333	39	45	24	48	4.727	39	33	18	45
3.954	33	36	22	51	4.344	36	39	24	51	4.740	39	36	21	48
3.958	19	45	..	48	4.354	33	30	19	48	4.745	33	30	22	51
3.963	30	33	17	39	4.364	27	33	24	45	4.751	21	51	45	39
3.968	30	36	20	42	4.370	24	42	39	51	4.762	20	39	..	42
3.972	39	45	22	48	4.375	21	45	..	48	4.773	36	33	21	48
3.977	30	33	21	48	4.387	22	27	21	39	4.777	17	55	51	33
3.982	33	39	24	51	4.392	24	45	42	51	4.786	42	39	20	45
3.986	27	33	19	39	4.396	30	39	24	42	4.793	30	27	22	51
3.992	45	42	19	51	4.400	27	30	22	45	4.800	27	30	24	45
4.000	27	36	24	45	4.406	27	33	21	39	4.807	19	48	51	42
4.006	39	42	22	51	4.412	30	36	27	51	4.813	30	33	27	51
4.011	33	36	21	48	4.420	33	42	27	48	4.821	36	42	27	48
4.018	30	42	27	48	4.429	30	33	19	39	4.827	48	39	20	51
4.021	24	27	19	42	4.434	42	39	21	51	4.835	33	39	24	42
4.029	30	39	22	42	4.444	20	42	..	45	4.843	39	30	19	51
4.034	36	42	24	51	4.453	27	24	19	48	4.848	30	33	24	45
4.040	30	33	20	45	4.461	39	36	21	51	4.853	33	36	27	51
4.048	17	39	..	42	4.466	33	36	19	39	4.858	27	22	19	48
4.060	30	36	19	39	4.471	36	30	19	51	4.866	39	33	21	51
4.064	36	33	19	51	4.476	24	33	24	39	4.875	39	30	18	48
4.072	30	39	27	51	4.480	33	39	27	51	4.887	36	39	27	51
4.078	24	45	39	51	4.486	19	48	51	45	4.895	30	33	21	39
4.083	21	48	42	45	4.492	36	33	21	51	4.902	45	36	20	51
4.091	27	33	21	42	4.500	27	30	24	48	4.911	33	42	30	48
4.098	33	30	19	51	4.508	42	33	17	48	4.916	27	42	39	51
4.103	30	39	24	45	4.514	39	36	20	48	4.922	27	24	21	48
4.113	30	33	19	42	4.524	19	45	..	42	4.926	42	36	19	45
4.118	21	48	..	51	4.529	33	30	21	51	4.935	36	33	19	42
4.125	33	45	27	48	4.533	36	30	17	45	4.941	36	30	21	51
4.136	21	55	39	36	4.540	39	42	22	45	4.945	30	39	27	42
4.147	33	36	19	42	4.547	42	39	19	45	4.948	45	36	19	48
4.156	24	33	24	42	4.553	33	27	19	51	4.952	39	42	24	45
4.160	33	42	27	51	4.558	24	27	20	39	4.959	20	55	45	33
4.167	20	39	..	48	4.567	45	39	19	48	4.967	48	36	19	51
4.171	39	33	18	51	4.571	36	42	24	45	4.977	33	39	30	51
4.176	36	39	19	42	4.575	42	36	20	51	4.990	39	33	19	45
4.183	20	51	48	45	4.583	22	39	..	48	5.000	24	36	..	48
4.190	33	42	24	45	4.588	39	30	18	51	5.014	24	27	22	39
4.196	27	33	20	39	4.602	27	22	18	48	5.025	19	55	48	33

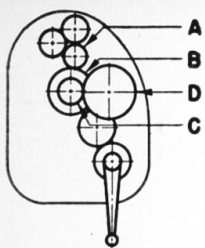


TABLE OF LEADS (5.033 to 6.291)

Lead of Spiral in Inches	A	B	C	D	Lead of Spiral in Inches	A	B	C	D	Lead of Spiral in Inches	A	B	C	D
5.033	42	36	22	51	5.440	33	39	27	42	5.882	30	36	..	51
5.038	42	33	19	48	5.444	42	36	21	45	5.887	48	33	17	42
5.042	33	30	22	48	5.455	36	33	24	48	5.893	33	36	27	42
5.048	45	39	21	48	5.469	45	36	21	48	5.903	55	33	17	48
5.056	39	36	21	45	5.481	27	24	19	39	5.911	42	30	19	45
5.065	39	33	18	42	5.489	39	30	19	45	5.921	30	19	18	48
5.068	21	51	48	39	5.495	45	39	20	42	5.926	24	27	24	36
5.077	33	39	27	45	5.500	33	36	27	45	5.934	36	39	27	42
5.080	45	33	19	51	5.510	27	21	18	42	5.939	42	33	21	45
5.085	42	36	17	39	5.515	39	33	21	45	5.948	39	27	21	51
5.091	36	33	21	45	5.527	19	55	48	30	5.954	33	27	19	39
5.098	39	36	24	51	5.538	36	39	27	45	5.961	48	30	19	51
5.104	42	36	21	48	5.546	33	21	18	51	5.966	45	33	21	48
5.114	30	33	27	48	5.552	27	22	19	42	5.975	33	27	22	45
5.123	33	24	19	51	5.556	20	39	..	36	5.983	42	36	20	39
5.128	20	42	..	39	5.561	39	33	24	51	5.989	42	33	24	51
5.135	20	51	55	42	5.568	42	33	21	48	5.994	51	39	22	48
5.143	36	42	27	45	5.573	30	19	18	51	6.000	27	39	..	45
5.147	45	36	21	51	5.581	39	33	17	36	6.010	42	33	17	36
5.152	17	45	..	33	5.587	22	45	48	42	6.019	39	27	20	48
5.156	33	36	27	48	5.594	30	33	24	39	6.027	27	42	45	48
5.160	33	27	19	45	5.600	36	30	21	45	6.032	48	36	19	42
5.170	39	33	21	48	5.608	39	30	22	51	6.039	42	30	22	51
5.176	51	39	19	48	5.615	45	33	21	51	6.044	33	39	30	42
5.185	42	36	20	45	5.625	27	36	..	48	6.050	36	21	18	51
5.192	36	39	27	48	5.630	48	36	19	45	6.054	39	24	19	51
5.195	30	33	24	42	5.641	22	42	..	39	6.058	27	24	21	39
5.200	39	30	18	45	5.647	36	30	24	51	6.061	20	42	..	33
5.208	45	36	20	48	5.657	42	33	20	45	6.067	39	30	21	45
5.216	42	30	19	51	5.664	39	27	20	51	6.071	45	30	17	42
5.223	27	48	39	42	5.675	39	36	22	42	6.090	45	36	19	39
5.229	48	36	20	51	5.682	45	33	20	48	6.095	24	45	48	42
5.238	22	45	..	42	5.687	39	30	21	48	6.100	42	27	20	51
5.241	42	33	21	51	5.692	55	36	19	51	6.107	27	20	19	42
5.250	27	30	21	36	5.698	30	27	20	39	6.111	22	42	..	36
5.255	17	55	51	30	5.704	42	36	22	45	6.118	39	30	24	51
5.260	27	22	18	42	5.714	24	39	..	42	6.125	42	30	21	48
5.265	42	39	22	45	5.718	39	27	19	48	6.130	33	19	18	51
5.272	33	27	22	51	5.727	27	22	21	45	6.136	36	33	27	48
5.278	19	42	..	36	5.735	39	24	18	51	6.141	48	33	19	45
5.288	33	39	30	48	5.744	42	39	24	45	6.154	24	42	..	39
5.294	27	36	..	51	5.752	33	27	24	51	6.162	33	21	20	51
5.303	42	33	20	48	5.758	19	42	..	33	6.169	45	33	19	42
5.312	51	36	18	48	5.762	33	30	22	42	6.176	36	24	21	51
5.322	30	21	19	51	5.769	36	39	30	48	6.182	51	33	18	45
5.333	24	39	..	45	5.775	36	33	27	51	6.190	39	36	24	42
5.339	19	55	51	33	5.782	30	21	17	42	6.198	51	36	21	48
5.347	42	36	22	48	5.789	33	19	17	51	6.205	33	30	22	39
5.353	39	30	21	51	5.795	51	33	18	48	6.209	45	27	19	51
5.359	33	30	19	39	5.804	30	42	39	48	6.222	42	36	24	45
5.369	27	22	21	48	5.807	21	51	55	39	6.231	39	27	22	51
5.378	33	30	22	45	5.816	27	21	19	42	6.237	39	33	19	36
5.385	21	42	..	39	5.820	30	27	22	42	6.250	30	36	..	48
5.392	45	36	22	51	5.824	33	30	27	51	6.257	39	33	27	51
5.398	45	33	19	48	5.833	21	39	..	36	6.268	30	27	22	39
5.413	30	27	19	39	5.844	30	33	27	42	6.275	48	33	22	51
5.419	48	33	19	51	5.854	33	21	19	51	6.282	42	36	21	39
5.429	36	30	19	42	5.864	30	27	19	36	6.286	33	21	18	45
5.432	30	27	22	45	5.874	36	33	21	39	6.291	21	51	55	36

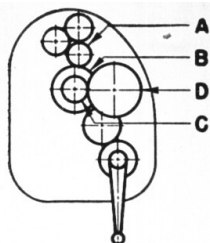


TABLE OF LEADS, STANDARD DRIVING MECHANISM

TABLE OF LEADS (6.296 to 7.483)

Lead of Spiral in Inches	A	B	C	D	Lead of Spiral in Inches	A	B	C	D	Lead of Spiral in Inches	A	B	C	D
6.296	17	45	..	27	6.699	33	24	19	39	7.059	45	30	24	51
6.303	39	33	24	45	6.710	42	27	22	51	7.062	39	27	22	45
6.316	36	19	17	51	6.713	36	33	24	39	7.071	33	30	27	44
6.319	39	27	21	48	6.717	42	33	19	36	7.083	17	45	..	24
6.333	19	42	..	30	6.722	33	24	22	45	7.086	48	33	19	39
6.340	48	33	17	39	6.729	51	30	19	48	7.091	39	33	27	45
6.346	33	36	27	39	6.734	30	27	20	33	7.105	36	19	18	48
6.349	48	36	20	42	6.738	42	33	27	51	7.112	42	22	19	51
6.353	36	30	27	51	6.741	39	27	21	45	7.125	36	20	19	48
6.356	39	30	22	45	6.746	55	33	17	42	7.130	42	27	22	48
6.364	21	42	..	33	6.750	36	30	27	48	7.136	51	27	17	45
6.375	51	30	18	48	6.756	48	30	19	45	7.143	30	39	..	42
6.387	36	21	19	51	6.761	51	33	21	48	7.152	33	19	21	51
6.393	22	45	51	39	6.769	33	30	24	39	7.159	42	33	27	48
6.400	36	30	24	45	6.774	60	33	19	51	7.175	39	22	17	42
6.405	42	27	21	51	6.779	33	21	22	51	7.179	42	36	24	39
6.410	45	36	20	39	6.786	45	30	19	42	7.190	33	27	30	51
6.417	36	33	30	51	6.790	30	27	22	36	7.200	36	30	27	45
6.420	39	27	20	45	6.797	39	27	24	51	7.206	42	24	21	51
6.429	27	39	..	42	6.806	42	27	21	48	7.212	51	33	21	45
6.439	45	33	17	36	6.810	39	30	22	42	7.222	39	27	24	48
6.447	22	42	48	39	6.818	36	33	30	48	7.232	33	17	19	51
6.451	33	27	19	36	6.821	42	30	19	39	7.240	30	39	48	51
6.462	42	39	27	45	6.830	55	30	19	51	7.245	39	19	18	51
6.465	48	33	20	45	6.838	48	36	20	39	7.253	36	39	33	42
6.471	33	36	..	51	6.845	24	51	48	33	7.259	42	27	21	45
6.477	36	22	19	48	6.853	42	33	21	39	7.265	45	27	17	39
6.481	42	27	20	48	6.857	36	30	24	42	7.273	24	42	..	33
6.490	27	39	45	48	6.863	45	27	21	51	7.279	33	24	27	51
6.494	45	33	20	42	6.869	48	33	17	36	7.283	39	21	20	51
6.500	39	30	24	48	6.875	33	30	..	48	7.286	51	30	18	42
6.513	33	19	18	48	6.878	39	27	20	42	7.292	45	27	21	48
6.519	33	27	24	45	6.882	39	30	27	51	7.299	39	22	21	51
6.525	51	33	19	45	6.894	39	33	21	36	7.308	45	30	19	39
6.531	33	20	19	48	6.902	48	30	22	51	7.313	39	20	18	48
6.536	45	27	20	51	6.908	30	19	21	48	7.320	42	27	24	51
6.545	36	33	27	45	6.914	42	27	20	45	7.326	30	21	20	39
6.555	39	21	18	51	6.919	39	21	19	51	7.333	33	36	..	45
6.563	36	24	21	48	6.923	27	42	..	39	7.341	19	55	51	24
6.568	42	27	19	45	6.926	48	33	20	42	7.347	27	21	24	42
6.577	39	21	17	48	6.933	39	30	24	45	7.353	45	24	20	51
6.581	42	36	22	39	6.939	36	21	17	42	7.368	30	19	21	45
6.588	42	30	24	51	6.944	45	27	20	48	7.385	36	30	24	39
6.593	45	39	24	42	6.947	33	19	18	45	7.389	42	24	19	45
6.600	33	30	27	45	6.952	39	33	30	51	7.395	33	21	24	51
6.608	27	22	21	39	6.955	18	55	51	24	7.403	36	22	19	42
6.611	42	24	17	45	6.960	30	21	19	39	7.407	20	45	..	27
6.618	30	24	27	51	6.964	39	36	27	42	7.412	42	30	27	51
6.623	51	33	18	42	6.968	33	39	42	51	7.418	45	39	27	42
6.632	27	19	21	45	6.972	48	27	20	51	7.424	42	33	21	36
6.635	33	21	19	45	6.984	48	36	22	42	7.429	39	30	24	42
6.643	45	33	19	39	6.993	45	33	20	39	7.438	51	30	21	48
6.648	39	33	27	48	7.000	21	42	..	30	7.444	33	19	18	42
6.667	30	36	..	45	7.010	39	24	22	51	7.451	42	21	19	51
6.679	33	20	17	42	7.013	36	33	27	42	7.459	48	33	20	39
6.684	55	36	21	48	7.018	30	19	20	45	7.464	33	20	19	42
6.687	36	19	18	51	7.030	33	19	17	42	7.469	33	27	22	36
6.691	39	24	21	51	7.037	19	45	..	27	7.474	36	17	18	51
6.696	30	42	45	48	7.051	30	24	22	39	7.483	30	21	22	42

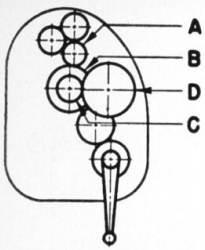


TABLE OF LEADS (7.487 to 8.766)

Lead of Spiral in Inches	A	B	C	D	Lead of Spiral in Inches	A	B	C	D	Lead of Spiral in Inches	A	B	C	D
7.487	42	33	30	51	7.889	36	17	19	51	8.319	33	21	27	51
7.492	33	19	22	51	7.897	42	30	22	39	8.322	51	33	21	39
7.500	36	33	..	48	7.901	48	27	20	45	8.333	30	39	..	36
7.506	48	27	19	45	7.908	33	18	22	51	8.342	39	22	24	51
7.517	39	21	17	42	7.912	48	39	27	42	8.352	42	22	21	48
7.521	48	36	22	39	7.917	19	42	..	24	8.357	39	30	27	42
7.529	51	33	19	39	7.933	51	30	21	45	8.366	48	27	24	51
7.538	42	30	21	39	7.944	39	36	33	45	8.374	33	17	22	51
7.549	42	24	22	51	7.955	42	33	30	48	8.381	48	30	22	42
7.552	36	33	27	39	7.964	33	39	48	51	8.388	55	27	21	51
7.557	42	22	19	48	7.972	36	22	19	39	8.392	36	33	30	39
7.563	33	20	22	48	7.977	42	27	20	39	8.400	42	30	27	45
7.566	39	27	22	42	7.983	45	21	19	51	8.403	45	21	20	51
7.571	33	19	17	39	7.988	55	27	20	51	8.412	39	30	33	51
7.576	60	33	20	48	7.993	33	17	21	51	8.422	45	22	21	51
7.583	39	30	21	36	8.000	36	33	..	45	8.426	39	27	21	36
7.589	55	27	19	51	8.011	39	21	22	51	8.438	36	24	27	48
7.597	39	33	27	42	8.016	33	19	18	39	8.444	48	24	19	45
7.600	36	20	19	45	8.021	42	24	22	48	8.452	39	19	21	51
7.605	42	27	22	45	8.028	51	24	17	45	8.462	33	36	..	39
7.612	33	17	20	51	8.036	45	36	27	42	8.471	36	17	18	45
7.615	33	30	27	39	8.042	48	27	19	42	8.482	45	24	19	42
7.619	48	30	20	42	8.050	39	19	20	51	8.488	55	27	20	48
7.623	39	27	19	36	8.059	30	21	22	39	8.493	33	17	21	48
7.628	42	24	17	39	8.063	55	27	19	48	8.497	39	27	30	51
7.636	36	22	21	45	8.067	36	21	24	51	8.502	30	19	21	39
7.639	33	27	30	48	8.072	39	18	19	51	8.512	39	24	22	42
7.646	51	27	17	42	8.077	45	30	21	39	8.515	48	21	19	51
7.656	42	24	21	48	8.081	60	33	20	45	8.523	45	22	20	48
7.669	48	27	22	51	8.088	33	24	30	51	8.531	39	20	21	48
7.677	36	27	19	33	8.095	17	45	..	21	8.538	55	24	19	51
7.684	33	17	19	48	8.105	33	19	21	45	8.545	51	27	19	42
7.692	30	36	..	39	8.114	21	55	51	24	8.553	39	19	20	48
7.697	39	19	18	48	8.120	55	33	19	39	8.556	42	30	22	36
7.700	33	20	21	45	8.128	48	22	19	51	8.571	36	33	..	42
7.704	39	27	24	45	8.143	36	20	19	42	8.576	39	24	19	36
7.714	36	30	27	42	8.148	22	42	..	27	8.594	33	24	30	48
7.721	45	24	21	51	8.157	51	33	19	36	8.603	39	24	27	51
7.727	17	45	..	22	8.163	30	21	24	42	8.615	42	30	24	39
7.734	33	24	27	48	8.167	42	24	21	45	8.627	42	21	22	51
7.738	39	36	30	42	8.173	45	24	17	39	8.636	19	45	..	22
7.741	55	30	19	45	8.182	27	39	..	33	8.643	33	20	22	42
7.749	48	27	17	39	8.196	33	17	19	45	8.654	45	36	27	39
7.758	48	33	24	45	8.205	48	36	24	39	8.661	48	27	19	39
7.765	36	30	33	51	8.211	39	19	18	45	8.667	39	33	..	45
7.778	21	42	..	27	8.231	33	21	22	42	8.673	45	21	17	42
7.792	51	30	22	48	8.235	48	24	21	51	8.684	33	19	24	48
7.800	39	30	27	45	8.242	51	33	24	45	8.693	51	22	18	48
7.813	45	24	20	48	8.250	33	20	24	48	8.708	33	20	19	36
7.822	48	30	22	45	8.254	39	27	24	42	8.715	60	27	20	51
7.829	42	19	17	48	8.259	36	19	17	39	8.720	36	17	21	51
7.832	42	33	24	39	8.264	51	27	21	48	8.727	36	30	24	33
7.841	39	21	19	45	8.273	39	30	21	33	8.730	33	27	30	42
7.846	51	30	18	39	8.282	51	30	19	39	8.739	39	21	24	51
7.857	33	36	..	42	8.289	36	19	21	48	8.745	27	19	24	39
7.861	42	22	21	51	8.296	42	27	24	45	8.750	21	45	..	24
7.870	45	27	17	36	8.305	36	17	20	51	8.754	39	27	20	33
7.875	42	30	27	48	8.308	36	30	27	39	8.758	51	22	17	45
7.879	39	33	30	45	8.312	48	33	24	42	8.766	45	33	27	42

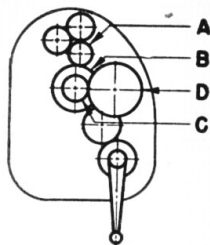


TABLE OF LEADS, STANDARD DRIVING MECHANISM

TABLE OF LEADS (8.769 to 10.094)

Lead of Spiral in Inches	A	B	C	D	Lead of Spiral in Inches	A	B	C	D	Lead of Spiral in Inches	A	B	C	D
8.769	36	20	19	39	9.184	30	21	27	42	9.630	39	27	24	36
8.775	42	27	22	39	9.192	39	27	21	33	9.636	42	19	17	39
8.782	33	17	19	42	9.202	51	27	19	39	9.643	36	24	27	42
8.787	55	27	22	51	9.205	36	22	27	48	9.651	48	21	19	45
8.791	30	21	24	39	9.211	42	19	20	48	9.659	39	19	24	51
8.796	60	27	19	48	9.215	55	27	19	42	9.670	33	21	24	39
8.800	33	20	24	45	9.231	36	33	..	39	9.676	55	24	19	45
8.811	42	33	27	39	9.236	42	24	19	36	9.686	39	17	19	45
8.815	51	27	21	45	9.244	45	21	22	51	9.692	42	30	27	39
8.821	39	20	19	42	9.253	45	22	19	42	9.700	55	27	20	42
8.827	39	27	22	36	9.259	60	27	20	48	9.706	36	24	33	51
8.831	48	22	17	42	9.273	51	33	27	45	9.714	51	21	18	45
8.839	33	24	27	42	9.281	33	20	27	48	9.722	45	27	21	36
8.844	39	21	20	42	9.288	45	19	20	51	9.728	39	21	22	42
8.854	55	22	17	48	9.297	51	24	21	48	9.740	45	33	30	42
8.864	39	33	36	48	9.301	42	22	19	39	9.744	48	24	19	39
8.867	42	20	19	45	9.308	33	20	22	39	9.750	39	30	27	36
8.882	45	19	18	48	9.314	60	24	19	51	9.757	55	21	19	51
8.889	24	42	..	27	9.333	42	30	24	36	9.770	33	19	27	48
8.897	33	17	22	48	9.341	45	21	17	39	9.778	55	30	24	45
8.905	51	30	22	42	9.346	39	27	33	51	9.788	51	30	19	33
8.909	42	22	21	45	9.351	48	33	27	42	9.796	36	21	24	42
8.916	36	19	24	51	9.356	39	24	19	33	9.800	42	20	21	45
8.922	39	18	21	51	9.375	36	24	30	48	9.808	51	24	18	39
8.929	45	24	20	42	9.385	39	22	27	51	9.818	36	20	18	33
8.932	55	30	19	39	9.402	33	27	30	39	9.825	42	19	20	45
8.938	39	20	22	48	9.408	39	19	22	48	9.832	39	21	27	51
8.941	36	17	19	45	9.412	42	21	24	51	9.844	42	24	27	48
8.947	17	45	..	19	9.421	36	22	19	33	9.852	42	18	19	45
8.951	48	33	24	39	9.429	33	21	27	45	9.860	48	21	22	51
8.956	42	27	19	33	9.436	55	24	21	51	9.868	45	19	20	48
8.964	48	21	20	51	9.441	45	33	27	39	9.872	55	30	21	39
8.972	51	24	19	45	9.446	39	17	21	51	9.877	48	27	20	36
8.980	39	19	21	48	9.455	39	30	24	33	9.882	36	17	21	45
8.990	33	39	51	48	9.474	18	45	..	19	9.886	55	24	22	51
9.000	27	42	..	30	9.481	48	27	24	45	9.890	30	21	27	39
9.015	42	22	17	36	9.490	33	17	22	45	9.894	51	27	22	42
9.023	30	19	24	42	9.500	19	45	..	20	9.900	33	20	27	45
9.031	51	20	17	48	9.506	55	27	21	45	9.907	48	19	20	51
9.048	19	45	..	21	9.510	51	33	24	39	9.917	30	22	24	33
9.053	55	27	20	45	9.519	33	24	27	39	9.926	45	24	27	51
9.059	42	30	33	51	9.524	20	45	..	21	9.931	39	24	22	36
9.066	27	42	55	39	9.533	39	20	22	45	9.935	51	33	27	42
9.071	55	24	19	48	9.536	42	19	22	51	9.955	33	17	20	39
9.076	36	21	27	51	9.545	21	45	..	22	9.959	55	27	22	45
9.081	39	17	19	48	9.549	55	24	20	48	9.965	36	17	24	51
9.091	30	36	..	33	9.559	39	24	30	51	9.969	51	27	19	36
9.098	33	19	22	42	9.563	51	20	18	48	9.972	39	22	27	48
9.102	42	19	21	51	9.573	42	27	24	39	9.989	55	24	17	39
9.107	51	36	27	42	9.579	39	19	21	45	10.000	24	45	..	24
9.117	48	27	20	39	9.586	45	19	17	42	10.026	55	24	21	48
9.123	39	19	20	45	9.590	51	30	22	39	10.031	36	19	27	51
9.135	45	24	19	39	9.596	45	27	19	33	10.037	39	17	21	48
9.141	39	24	27	48	9.600	48	30	27	45	10.053	60	27	19	42
9.148	39	18	19	45	9.603	55	30	22	42	10.065	42	27	33	51
9.150	42	27	30	51	9.608	42	18	21	51	10.070	36	22	24	39
9.154	51	30	21	39	9.613	51	24	19	42	10.076	42	22	19	36
9.167	33	39	..	36	9.619	55	27	17	36	10.084	45	21	24	51
9.176	39	30	36	51	9.625	42	20	22	48	10.094	51	20	19	48

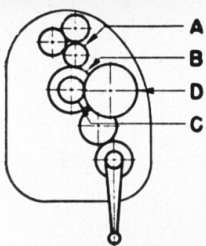


TABLE OF LEADS (10.096 to 11.692)

Lead of Spiral in Inches	A	B	C	D	Lead of Spiral in Inches	A	B	C	D	Lead of Spiral in Inches	A	B	C	D
10.096	45	24	21	39	10.625	51	24	18	36	11.156	51	20	21	48
10.102	33	21	27	42	10.636	39	22	27	45	11.165	55	24	19	39
10.107	42	22	27	51	10.644	60	21	19	51	11.172	39	24	33	48
10.119	55	22	17	42	10.655	51	27	22	39	11.176	19	45	..	17
10.125	36	20	27	48	10.658	36	19	27	48	11.184	45	19	17	36
10.133	48	20	19	45	10.670	55	27	22	42	11.189	48	33	30	39
10.142	51	22	21	48	10.688	33	19	24	39	11.200	42	30	36	45
10.150	30	19	27	42	10.694	42	27	33	48	11.204	55	24	22	45
10.156	39	24	30	48	10.699	51	22	18	39	11.211	36	17	27	51
10.160	60	22	19	51	10.706	42	30	39	51	11.216	39	17	22	45
10.168	33	17	22	42	10.714	33	22	30	42	11.224	45	21	22	42
10.173	42	17	21	51	10.739	42	22	27	48	11.230	42	22	30	51
10.185	55	27	24	48	10.744	39	22	20	33	11.250	27	42	..	24
10.200	51	30	27	45	10.751	55	27	19	36	11.259	48	18	19	45
10.208	42	24	21	36	10.756	48	21	24	51	11.278	45	19	20	42
10.217	45	19	22	51	10.769	42	33	..	39	11.282	55	30	24	39
10.227	36	22	30	48	10.774	48	27	20	33	11.294	51	22	19	39
10.236	48	27	19	33	10.784	45	27	33	51	11.298	55	21	22	51
10.252	55	19	17	48	10.794	51	27	24	42	11.308	42	20	21	39
10.263	39	19	24	48	10.800	36	20	27	45	11.313	42	27	24	33
10.271	55	21	20	51	10.809	42	17	21	48	11.317	55	27	20	36
10.280	42	22	21	39	10.818	51	22	21	45	11.324	42	24	33	51
10.286	48	30	27	42	10.822	55	18	17	48	11.329	36	22	27	39
10.294	55	22	21	51	10.827	36	19	24	42	11.336	42	19	20	39
10.303	51	33	24	36	10.833	39	33	..	36	11.345	45	21	27	51
10.313	45	30	33	48	10.855	45	19	22	48	11.352	55	19	20	51
10.324	45	19	17	39	10.860	30	17	24	39	11.364	45	33	30	36
10.340	48	21	19	42	10.867	39	19	27	51	11.368	36	19	27	45
10.353	51	24	19	39	10.875	51	27	19	33	11.375	42	30	39	48
10.362	45	19	21	48	10.884	48	21	20	42	11.383	55	18	19	51
10.370	42	27	24	36	10.889	42	18	21	45	11.396	60	27	20	39
10.378	39	17	19	42	10.900	45	17	21	51	11.407	42	27	33	45
10.385	45	30	27	39	10.909	36	39	..	33	11.416	55	21	17	39
10.390	45	22	20	42	10.913	55	24	20	42	11.423	33	20	27	39
10.400	39	30	36	45	10.919	33	17	27	48	11.429	24	45	..	21
10.408	51	21	18	42	10.924	39	21	30	51	11.435	39	18	19	36
10.413	36	22	21	33	10.931	30	19	27	39	11.442	51	24	21	39
10.421	33	19	27	45	10.940	48	27	24	39	11.455	42	22	27	45
10.431	42	17	19	45	10.950	33	17	22	39	11.471	39	17	24	48
10.440	45	21	19	39	10.962	45	20	19	39	11.483	36	19	20	33
10.446	55	27	20	39	10.969	55	27	21	39	11.491	55	27	22	39
10.452	33	17	21	39	10.980	42	18	24	51	11.503	48	18	22	51
10.462	48	20	17	39	10.986	51	21	19	42	11.515	60	22	19	45
10.476	22	45	..	21	10.992	42	22	19	33	11.529	42	17	21	45
10.490	45	33	30	39	11.000	33	42	..	30	11.538	45	30	..	39
10.500	21	45	..	20	11.014	45	22	21	39	11.546	39	19	27	48
10.505	39	27	24	33	11.020	36	21	27	42	11.556	39	27	36	45
10.515	39	24	33	51	11.029	45	24	30	51	11.570	42	22	20	33
10.519	36	22	27	42	11.039	51	33	30	42	11.579	22	45	..	19
10.526	20	45	..	19	11.053	21	45	..	19	11.591	51	22	21	42
10.547	45	24	27	48	11.058	55	21	19	45	11.607	39	24	30	42
10.556	19	45	..	18	11.073	48	17	20	51	11.611	55	20	19	45
10.577	33	24	30	39	11.080	39	22	30	48	11.624	51	27	24	39
10.582	60	27	20	42	11.092	36	21	33	51	11.636	48	22	24	45
10.588	18	45	..	17	11.111	30	39	..	27	11.647	33	17	27	45
10.593	39	27	33	45	11.123	39	33	48	51	11.660	36	19	24	39
10.601	55	21	17	42	11.131	51	24	22	42	11.667	42	33	..	36
10.607	33	20	27	42	11.136	42	22	21	36	11.688	60	33	27	42
10.614	33	19	22	36	11.146	36	19	30	51	11.692	48	20	19	39

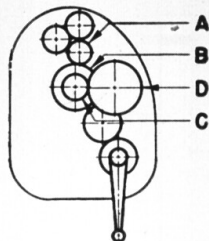


TABLE OF LEADS, STANDARD DRIVING MECHANISM

TABLE OF LEADS (11.703 to 13.303)

Lead of Spiral in Inches	A	B	C	D	Lead of Spiral in Inches	A	B	C	D	Lead of Spiral in Inches	A	B	C	D
11.703	42	19	27	51	12.217	45	17	18	39	12.745	45	27	39	51
11.719	45	24	30	48	12.222	33	39	..	27	12.750	51	30	27	36
11.729	39	19	24	42	12.235	51	22	19	36	12.759	55	21	19	39
11.733	48	20	22	45	12.245	45	21	24	42	12.768	39	24	33	42
11.743	51	19	21	48	12.250	42	20	21	36	12.773	48	17	19	42
11.748	42	22	24	39	12.273	27	42	..	22	12.784	45	22	30	48
11.752	55	24	20	39	12.281	42	19	20	36	12.795	60	27	19	33
11.765	20	48	..	17	12.303	51	19	22	48	12.800	48	20	24	45
11.769	51	30	27	39	12.308	42	21	24	39	12.806	55	17	19	48
11.777	45	22	19	33	12.316	39	19	27	45	12.817	51	21	19	36
11.789	42	19	24	45	12.325	55	21	24	51	12.821	55	22	20	39
11.806	55	22	17	36	12.338	60	22	19	42	12.829	39	19	30	48
11.813	42	20	27	48	12.346	60	27	20	36	12.834	48	22	30	51
11.818	39	36	..	33	12.353	21	45	..	17	12.857	27	45	..	21
11.831	51	21	19	39	12.364	51	22	24	45	12.866	55	19	20	45
11.842	45	19	24	48	12.375	33	24	27	30	12.879	51	33	30	36
11.846	42	30	33	39	12.381	39	27	36	42	12.891	45	24	33	48
11.852	48	27	24	36	12.389	51	19	18	39	12.896	45	17	19	39
11.863	33	17	22	36	12.397	45	22	20	33	12.904	39	17	27	48
11.868	36	21	27	39	12.409	39	22	21	30	12.919	30	19	27	33
11.875	51	17	19	48	12.418	60	18	19	51	12.923	42	20	24	39
11.883	55	27	21	36	12.423	51	20	19	39	12.929	48	27	24	33
11.889	48	19	24	51	12.434	42	19	27	48	12.941	22	45	..	17
11.895	42	27	39	51	12.440	55	20	19	42	12.952	51	21	24	45
11.900	51	20	21	45	12.449	55	27	22	36	12.963	55	27	21	33
11.905	45	27	30	42	12.457	45	17	24	51	12.981	45	24	27	39
11.912	36	17	27	48	12.462	36	20	27	39	12.991	48	18	19	39
11.917	39	30	33	36	12.467	51	20	22	45	13.000	39	36	..	30
11.922	48	17	19	45	12.472	55	21	20	42	13.017	45	22	21	33
11.932	42	22	30	48	12.479	33	17	27	42	13.026	36	19	33	48
11.939	39	21	27	42	12.487	55	19	22	51	13.032	36	17	24	39
11.946	33	17	24	39	12.500	45	33	..	36	13.040	51	22	27	48
11.953	51	24	27	48	12.513	39	22	36	51	13.061	48	21	24	42
11.963	51	18	19	45	12.526	51	19	21	45	13.072	60	18	20	51
11.973	48	21	22	42	12.536	55	27	24	39	13.080	42	17	27	51
11.983	55	18	20	51	12.544	39	19	22	36	13.095	45	27	33	42
11.987	51	24	22	39	12.549	48	18	24	51	13.109	39	21	36	51
12.000	36	39	..	30	12.557	39	33	51	48	13.117	36	19	27	39
12.004	55	21	22	48	12.564	42	18	21	39	13.125	42	24	36	48
12.017	39	21	33	51	12.571	36	21	33	45	13.131	39	27	30	33
12.024	33	19	27	39	12.582	55	18	21	51	13.149	45	22	27	42
12.031	42	24	33	48	12.587	45	33	36	39	13.162	42	27	33	39
12.037	39	27	30	36	12.593	51	27	24	36	13.176	42	17	24	45
12.042	51	20	17	36	12.600	42	20	27	45	13.181	55	18	22	51
12.053	55	17	19	51	12.606	39	33	48	45	13.187	36	21	30	39
12.057	36	19	21	33	12.618	55	19	17	39	13.195	39	19	27	42
12.063	60	21	19	45	12.632	24	45	..	19	13.200	36	20	33	45
12.074	39	19	30	51	12.639	42	27	39	48	13.209	39	17	19	33
12.088	33	21	30	39	12.656	45	20	27	48	13.217	42	22	27	39
12.095	55	24	19	36	12.662	39	22	30	42	13.223	48	22	20	33
12.101	48	21	27	51	12.667	60	20	19	45	13.233	48	19	22	42
12.108	39	17	19	36	12.675	51	19	17	36	13.241	39	27	33	36
12.115	42	24	27	39	12.687	55	17	20	51	13.247	51	22	24	42
12.121	60	22	20	45	12.692	45	30	33	39	13.263	42	19	27	45
12.133	42	30	39	45	12.698	48	27	30	42	13.268	55	19	22	48
12.149	42	22	21	33	12.706	36	17	27	45	13.281	51	24	30	48
12.179	60	24	19	39	12.721	51	21	22	42	13.287	48	17	24	51
12.188	39	22	33	48	12.727	42	36	..	33	13.295	39	22	36	48
12.201	45	19	17	33	12.731	55	24	20	36	13.303	42	17	21	39

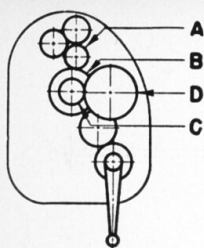


TABLE OF LEADS (13.322 to 15.231)

Lead of Spiral in Inches	A	B	C	D	Lead of Spiral in Inches	A	B	C	D	Lead of Spiral in Inches	A	B	C	D
13.322	45	19	27	48	13.929	39	22	33	42	14.592	39	21	33	42
13.333	48	33	..	36	13.937	42	17	22	39	14.599	42	22	39	51
13.347	51	22	19	33	13.956	55	17	22	51	14.609	51	24	33	48
13.357	51	20	22	42	13.971	60	17	19	48	14.615	60	20	19	39
13.368	55	24	21	36	13.986	60	33	30	39	14.625	39	30	27	24
13.375	48	19	27	51	14.000	42	36	..	30	14.636	55	17	19	42
13.382	42	24	39	51	14.005	55	24	22	36	14.641	51	19	18	33
13.388	36	22	27	33	14.014	45	17	27	51	14.652	60	21	20	39
13.397	55	20	19	39	14.020	39	18	33	51	14.661	36	17	27	39
13.406	39	20	33	48	14.026	48	22	27	42	14.667	55	20	24	45
13.421	51	19	24	48	14.035	60	19	20	45	14.682	51	20	19	33
13.431	55	21	20	39	14.060	51	19	22	42	14.694	48	21	27	42
13.439	33	17	27	39	14.066	48	21	24	39	14.706	45	18	30	51
13.445	48	21	30	51	14.074	60	18	19	45	14.712	51	24	27	39
13.458	51	20	19	36	14.103	60	24	22	39	14.727	36	22	27	30
13.468	60	27	20	33	14.112	39	19	33	48	14.737	42	19	30	45
13.474	48	19	24	45	14.118	24	48	..	17	14.748	39	17	27	42
13.481	42	27	39	45	14.141	42	27	30	33	14.752	51	22	21	33
13.492	51	27	30	42	14.152	55	19	22	45	14.769	48	20	24	39
13.500	27	42	..	20	14.161	45	22	27	39	14.774	55	21	22	39
13.509	42	19	22	36	14.167	51	24	30	45	14.790	48	21	33	51
13.523	51	24	21	33	14.182	39	30	36	33	14.803	45	19	30	48
13.534	36	19	30	42	14.211	27	42	..	19	14.808	42	24	33	39
13.542	45	27	39	48	14.219	42	24	39	48	14.815	55	27	24	33
13.571	60	20	19	42	14.225	42	17	19	33	14.824	42	17	27	45
13.580	55	27	24	36	14.251	48	19	22	39	14.835	45	21	27	39
13.600	51	20	24	45	14.259	42	27	33	36	14.841	51	27	33	42
13.611	42	18	21	36	14.266	51	22	24	39	14.850	33	20	27	30
13.622	55	19	24	51	14.286	30	39	..	21	14.861	48	19	30	51
13.636	45	36	..	33	14.300	39	20	33	45	14.875	51	20	21	36
13.660	55	17	19	45	14.316	51	19	24	45	14.886	55	18	19	39
13.670	55	19	17	36	14.338	45	24	39	51	14.890	45	17	27	48
13.675	48	27	30	39	14.344	51	20	27	48	14.896	39	36	33	24
13.684	39	19	30	45	14.351	39	33	51	42	14.903	51	22	27	42
13.700	51	21	22	39	14.359	42	27	36	39	14.928	39	19	24	33
13.714	48	21	27	45	14.379	55	18	24	51	14.938	55	27	22	30
13.719	55	21	22	42	14.385	51	30	33	39	14.945	51	21	24	39
13.725	45	27	42	51	14.394	60	24	19	33	14.954	51	18	19	36
13.731	51	20	21	39	14.400	48	20	27	45	14.966	55	21	24	42
13.737	51	27	24	33	14.405	55	20	22	42	14.973	42	17	20	33
13.750	33	42	..	24	14.412	42	17	21	36	15.000	45	36	..	30
13.756	48	17	19	39	14.423	45	24	30	39	15.038	60	19	20	42
13.765	39	17	27	45	14.429	55	18	17	36	15.043	48	27	33	39
13.776	45	21	27	42	14.436	48	19	24	42	15.053	39	19	33	45
13.788	42	36	39	33	14.444	39	36	..	27	15.059	48	17	24	45
13.804	48	17	22	45	14.453	51	19	21	39	15.072	45	19	21	33
13.816	42	19	30	48	14.464	45	20	27	42	15.079	60	21	19	36
13.823	55	21	19	36	14.474	55	19	24	48	15.098	55	17	21	45
13.841	60	17	20	51	14.480	48	17	20	39	15.105	48	22	27	39
13.846	48	24	27	39	14.489	51	22	30	48	15.111	51	30	24	27
13.853	48	21	20	33	14.504	39	22	27	33	15.126	45	21	36	51
13.866	45	21	33	51	14.514	55	20	19	36	15.152	45	33	30	27
13.878	51	21	24	42	14.530	51	27	30	39	15.158	48	19	27	45
13.884	42	22	24	33	14.538	42	20	27	39	15.167	42	36	39	30
13.889	45	27	30	36	14.545	48	36	..	33	15.179	51	24	30	42
13.897	42	17	27	48	14.550	55	27	30	42	15.195	39	22	36	42
13.904	39	17	20	33	14.559	36	17	33	48	15.204	42	17	24	39
13.909	51	30	27	33	14.571	51	21	27	45	15.225	55	17	24	51
13.919	60	21	19	39	14.583	42	36	30	24	15.231	36	20	33	39

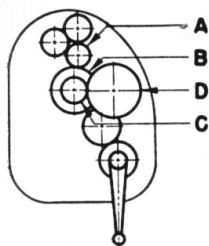


TABLE OF LEADS, STANDARD DRIVING MECHANISM

TABLE OF LEADS (15.241 to 17.550)

Lead of Spiral in Inches	A	B	C	D	Lead of Spiral in Inches	A	B	C	D	Lead of Spiral in Inches	A	B	C	D
15.241	45	17	19	33	15.966	60	17	19	42	16.783	48	22	30	39
15.256	51	18	21	39	15.983	51	27	33	39	16.794	39	19	27	33
15.273	42	33	36	30	16.000	48	36	..	30	16.800	42	20	36	45
15.278	55	24	24	36	16.032	36	19	33	39	16.806	55	30	33	36
15.294	42	21	39	51	16.042	42	36	33	24	16.813	51	21	27	39
15.300	51	20	27	45	16.049	51	22	27	39	16.824	39	17	33	45
15.306	45	21	30	42	16.071	45	24	36	42	16.837	45	21	33	42
15.311	48	19	20	33	16.082	55	19	20	36	16.845	45	22	42	51
15.321	39	20	33	42	16.105	51	19	27	45	16.852	42	36	39	27
15.338	51	19	24	42	16.117	55	21	24	39	16.859	51	22	24	33
15.354	48	18	19	33	16.127	55	18	19	36	16.875	45	24	27	30
15.385	45	39	36	27	16.134	48	21	36	51	16.886	55	19	21	36
15.395	39	19	36	48	16.150	51	20	19	30	16.904	42	19	39	51
15.400	42	20	33	45	16.162	48	33	30	27	16.917	45	19	30	42
15.407	39	27	48	45	16.176	55	17	24	48	16.923	55	20	24	39
15.429	36	21	27	30	16.190	51	21	30	45	16.947	55	17	22	42
15.439	55	19	24	45	16.200	36	20	27	30	16.970	42	33	36	27
15.441	42	17	30	48	16.211	42	19	33	45	16.985	42	17	33	48
15.455	51	36	..	33	16.239	60	18	19	39	17.000	51	36	..	30
15.469	45	20	33	48	16.250	39	36	..	24	17.017	45	17	27	42
15.476	45	27	39	42	16.257	48	17	19	33	17.028	55	19	30	51
15.502	36	19	27	33	16.283	55	19	27	48	17.045	45	33	30	24
15.513	55	20	22	39	16.290	36	17	30	39	17.053	36	19	27	30
15.529	36	17	33	45	16.296	48	27	33	36	17.063	42	20	39	48
15.547	48	19	24	39	16.313	51	18	19	33	17.075	55	17	19	36
15.556	42	36	..	27	16.327	48	21	30	42	17.081	51	19	21	33
15.571	45	17	30	51	16.333	42	18	21	30	17.094	60	27	30	39
15.577	45	20	27	39	16.346	51	24	30	39	17.105	39	19	30	36
15.587	55	19	21	39	16.364	36	39	..	22	17.112	48	17	20	33
15.600	39	20	36	45	16.370	39	27	51	45	17.128	45	17	33	51
15.612	51	21	27	42	16.387	45	21	39	51	17.143	36	39	..	21
15.620	42	22	27	33	16.397	45	19	27	39	17.172	51	33	30	27
15.625	45	36	30	24	16.404	51	19	22	36	17.182	42	22	27	30
15.632	33	19	27	30	16.410	48	27	36	39	17.195	60	17	19	39
15.642	45	22	39	51	16.421	39	19	36	45	17.206	39	17	36	48
15.658	51	19	21	36	16.450	60	21	19	33	17.225	36	19	30	33
15.670	55	27	30	39	16.471	42	17	30	45	17.236	55	27	33	39
15.686	48	18	30	51	16.484	45	21	30	39	17.255	55	17	24	45
15.692	51	20	24	39	16.500	33	36	..	20	17.273	51	17	19	33
15.714	48	24	33	42	16.508	48	27	39	42	17.308	45	24	36	39
15.724	33	39	..	21	16.518	51	19	24	39	17.316	60	21	20	33
15.734	45	22	30	39	16.529	60	22	20	33	17.326	36	17	27	33
15.741	51	27	30	36	16.544	45	17	30	48	17.333	48	36	39	30
15.750	42	24	27	30	16.558	51	22	30	42	17.347	51	21	30	42
15.762	55	17	19	39	16.579	42	19	36	48	17.355	42	33	30	22
15.772	39	17	33	48	16.593	42	27	48	45	17.368	33	39	..	19
15.789	30	42	..	19	16.609	48	17	30	51	17.376	48	17	24	39
15.817	55	17	22	45	16.615	48	20	27	39	17.386	51	24	27	33
15.824	48	21	27	39	16.623	48	21	24	33	17.411	45	24	39	42
15.833	51	17	19	36	16.639	36	17	33	42	17.421	55	17	21	39
15.865	45	24	33	39	16.667	45	36	..	27	17.439	42	17	36	51
15.873	55	21	20	33	16.684	48	22	39	51	17.455	48	33	36	30
15.882	27	42	..	17	16.696	51	24	33	42	17.471	33	17	27	30
15.889	39	30	33	27	16.705	42	22	21	24	17.479	48	21	39	51
15.909	42	33	30	24	16.714	39	20	36	42	17.490	48	19	27	39
15.918	39	21	36	42	16.725	39	19	22	27	17.500	42	39	..	24
15.928	48	17	22	39	16.736	45	22	27	33	17.531	51	20	33	48
15.938	51	20	30	48	16.762	48	21	33	45	17.540	39	27	51	42
15.955	39	22	27	30	16.776	51	19	30	48	17.550	39	20	27	30

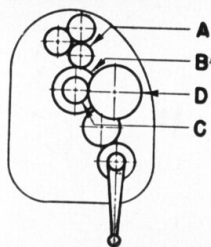


TABLE OF LEADS (17.582 to 20.588)

Lead of Spiral in Inches	A	B	C	D	Lead of Spiral in Inches	A	B	C	D	Lead of Spiral in Inches	A	B	C	D
17.582	48	21	30	39	18.519	60	27	30	36	19.479	51	24	33	36
17.593	60	18	19	36	18.529	42	17	36	48	19.500	39	36	..	20
17.600	48	20	33	45	18.545	51	30	36	33	19.522	51	19	24	33
17.622	42	39	36	22	18.571	39	36	..	21	19.548	48	17	27	39
17.630	42	27	51	45	18.583	51	19	27	39	19.556	48	30	33	27
17.647	30	39	..	17	18.595	45	22	30	33	19.592	48	21	36	42
17.654	51	20	27	39	18.609	45	19	33	42	19.608	60	17	20	36
17.662	51	21	24	33	18.627	60	17	19	36	19.615	51	24	36	39
17.679	45	20	33	42	18.660	39	19	30	33	19.636	48	22	27	30
17.690	55	19	22	36	18.673	55	27	33	36	19.643	33	21	30	24
17.708	51	24	30	36	18.685	45	17	36	51	19.664	39	17	36	42
17.727	39	36	..	22	18.700	51	20	33	45	19.684	51	19	33	45
17.763	45	19	36	48	18.707	55	21	30	42	19.697	45	33	39	27
17.778	48	33	..	27	18.731	55	19	33	51	19.732	51	24	39	42
17.810	51	21	33	45	18.750	45	36	..	24	19.744	42	18	33	39
17.824	55	18	21	36	18.770	39	17	27	33	19.765	42	17	36	45
17.832	51	22	30	39	18.803	55	18	24	39	19.780	45	21	36	39
17.843	42	18	39	51	18.816	39	19	33	36	19.800	36	30	33	20
17.851	48	22	27	33	18.824	48	18	36	51	19.810	48	21	39	45
17.857	60	24	30	42	18.857	48	20	33	42	19.835	48	22	30	33
17.875	39	30	33	24	18.873	55	17	21	36	19.850	48	19	33	42
17.898	45	22	42	48	18.881	45	22	36	39	19.861	39	27	33	24
17.919	36	17	33	39	18.889	51	33	..	27	19.870	51	22	36	42
17.949	45	39	42	27	18.900	42	20	27	30	19.895	42	19	27	30
17.959	48	21	33	42	18.909	48	33	39	30	19.910	55	17	24	39
17.968	42	17	24	33	18.947	36	39	..	19	19.922	45	24	51	48
17.981	51	24	33	39	18.958	42	36	39	24	19.931	48	17	36	51
18.000	36	39	..	20	18.967	51	22	27	33	20.000	48	36	..	24
18.006	55	24	33	42	18.994	45	22	39	42	20.040	45	19	33	39
18.025	39	17	33	42	19.031	55	17	30	51	20.074	42	17	39	48
18.030	51	18	21	33	19.038	45	20	33	39	20.096	42	19	30	33
18.045	48	19	30	42	19.048	55	21	24	33	20.132	51	19	36	48
18.056	45	36	39	27	19.059	36	17	27	30	20.147	55	21	30	39
18.086	42	19	27	33	19.082	51	21	33	42	20.167	55	20	22	30
18.092	55	19	30	48	19.091	42	36	..	22	20.192	45	39	42	24
18.100	60	17	20	39	19.097	55	24	30	36	20.202	60	27	30	33
18.111	45	19	39	51	19.118	45	18	39	51	20.211	48	19	24	30
18.118	42	17	33	45	19.125	51	24	27	30	20.222	42	30	39	27
18.132	45	21	33	39	19.139	60	19	20	33	20.238	51	21	30	36
18.151	48	17	27	42	19.145	48	39	42	27	20.250	45	20	27	30
18.182	48	33	30	24	19.158	42	19	39	45	20.260	39	33	36	21
18.200	42	20	39	45	19.173	51	19	30	42	20.301	45	19	36	42
18.219	45	19	30	39	19.192	60	18	19	33	20.321	60	17	19	33
18.250	55	17	22	39	19.206	55	21	33	45	20.342	42	27	51	39
18.270	48	17	33	51	19.231	55	22	30	39	20.362	45	17	30	39
18.286	48	21	36	45	19.243	45	19	39	48	20.370	55	33	..	27
18.308	42	30	51	39	19.250	42	30	33	24	20.392	48	18	39	51
18.326	45	17	27	39	19.259	48	36	39	27	20.400	51	20	24	30
18.333	55	33	..	30	19.286	45	21	27	30	20.408	60	21	30	42
18.353	39	17	36	45	19.298	55	19	30	45	20.433	55	19	36	51
18.367	45	21	36	42	19.319	48	19	39	51	20.455	45	36	..	22
18.373	48	19	24	33	19.341	48	21	33	39	20.463	51	36	39	27
18.384	42	33	39	27	19.378	45	19	27	33	20.513	45	27	48	39
18.409	45	22	27	30	19.385	42	20	36	39	20.526	39	36	..	19
18.421	55	19	21	33	19.394	48	33	36	27	20.535	48	17	24	33
18.454	51	19	33	48	19.412	33	36	..	17	20.549	51	21	33	39
18.462	48	24	36	39	19.429	51	21	36	45	20.571	48	21	27	30
18.474	39	19	27	30	19.433	48	19	30	39	20.578	55	21	33	42
18.487	55	17	24	42	19.444	45	36	42	27	20.588	55	17	21	33

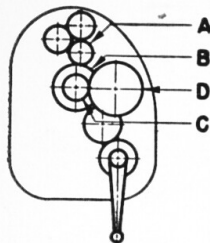
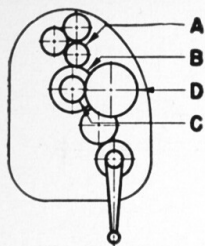


TABLE OF LEADS, STANDARD DRIVING MECHANISM

TABLE OF LEADS (20.606 to 24.740)

Lead of Spiral in Inches	A	B	C	D	Lead of Spiral in Inches	A	B	C	D	Lead of Spiral in Inches	A	B	C	D
20.606	51	33	36	27	21.857	51	21	27	30	23.214	45	36	39	21
20.625	45	30	33	24	21.862	45	19	36	39	23.253	48	17	42	51
20.635	39	21	30	27	21.875	45	36	42	24	23.269	55	20	33	39
20.648	51	19	30	39	21.895	48	19	39	45	23.294	36	17	33	30
20.670	48	19	27	33	21.962	51	19	27	33	23.320	48	19	36	39
20.682	42	33	39	24	21.978	60	21	30	39	23.333	42	36	..	18
20.706	48	17	33	45	22.000	48	30	33	24	23.375	51	30	33	24
20.719	51	20	39	48	22.028	45	39	42	22	23.400	39	30	36	20
20.741	48	36	42	27	22.037	42	27	51	36	23.437	45	24	30	24
20.769	45	20	36	39	22.059	45	17	30	36	23.459	48	19	39	42
20.778	51	30	33	27	22.068	39	36	55	27	23.487	51	19	42	48
20.798	45	17	33	42	22.078	51	21	30	33	23.504	55	18	30	39
20.805	48	19	42	51	22.105	42	36	..	19	23.529	55	17	24	33
20.816	51	21	36	42	22.154	48	20	36	39	23.538	51	20	36	39
20.826	42	33	36	22	22.185	48	17	33	42	23.579	48	19	42	45
20.833	45	27	30	24	22.222	48	36	45	27	23.611	51	27	30	24
20.842	36	30	33	19	22.235	42	17	27	30	23.636	48	33	39	24
20.856	39	17	30	33	22.243	55	17	33	48	23.684	45	33	..	19
20.864	51	22	27	30	22.262	51	21	33	36	23.725	55	17	22	30
20.905	42	17	33	39	22.286	39	30	36	21	23.765	42	27	55	36
20.934	55	17	33	51	22.313	51	20	42	48	23.800	51	20	42	45
20.952	48	21	33	36	22.323	51	33	39	27	23.810	45	21	30	27
20.979	60	22	30	39	22.344	39	24	33	24	23.824	45	17	27	30
21.000	42	39	..	20	22.368	51	19	30	36	23.833	39	27	33	20
21.010	48	33	39	27	22.392	39	33	36	19	23.864	45	33	42	24
21.029	39	17	33	36	22.400	48	20	42	45	23.891	48	17	33	39
21.053	55	19	24	33	22.418	51	21	36	39	23.947	42	19	39	36
21.074	51	22	30	33	22.449	55	21	36	42	23.974	51	18	33	39
21.099	48	21	36	39	22.460	42	17	30	33	24.000	48	33	..	20
21.154	55	20	30	39	22.500	45	36	..	20	24.040	51	33	42	27
21.176	36	39	..	17	22.551	51	21	39	42	24.063	42	24	33	24
21.212	45	33	42	27	22.564	48	18	33	39	24.074	55	27	39	33
21.228	55	19	22	30	22.579	39	30	33	19	24.115	42	33	36	19
21.250	51	33	..	24	22.588	48	17	36	45	24.123	55	19	30	36
21.273	39	30	36	22	22.626	42	27	48	33	24.158	51	19	27	30
21.316	45	19	27	30	22.667	51	30	36	27	24.176	55	21	36	39
21.333	48	30	36	27	22.689	45	17	36	42	24.202	48	17	36	42
21.377	48	19	33	39	22.698	39	27	33	21	24.231	45	20	42	39
21.389	42	27	33	24	22.713	51	19	33	39	24.242	48	33	45	27
21.399	51	22	36	39	22.727	45	27	30	22	24.265	55	17	36	48
21.412	42	17	39	45	22.737	48	19	27	30	24.286	51	33	..	21
21.429	45	36	..	21	22.744	55	19	33	42	24.292	60	19	30	39
21.450	39	30	33	20	22.750	42	30	39	24	24.316	42	30	33	19
21.474	51	19	36	45	22.768	51	21	45	48	24.375	45	30	39	24
21.507	45	17	39	48	22.805	42	17	36	39	24.402	51	19	30	33
21.526	51	22	39	42	22.837	55	17	36	51	24.434	45	17	36	39
21.538	48	24	42	39	22.857	48	33	..	21	24.444	55	30	36	27
21.577	51	20	33	39	22.885	51	24	42	39	24.471	48	17	39	45
21.592	48	17	39	51	22.909	42	30	36	22	24.494	55	19	33	39
21.607	55	20	33	42	22.917	55	30	..	24	24.519	45	24	51	39
21.636	51	33	42	30	22.941	39	36	..	17	24.545	45	30	36	22
21.654	48	19	36	42	22.967	48	19	30	33	24.561	42	19	30	27
21.667	39	36	..	18	23.008	51	19	36	42	24.580	45	17	39	42
21.711	55	19	36	48	23.021	51	24	39	36	24.605	51	19	33	36
21.719	48	17	30	39	23.077	48	24	45	39	24.615	48	21	42	39
21.795	51	18	30	39	23.100	42	30	33	20	24.632	39	30	36	19
21.809	51	19	39	48	23.111	48	30	39	27	24.706	42	36	..	17
21.818	48	33	..	22	23.158	55	19	24	30	24.727	48	22	51	45
21.825	55	21	30	36	23.182	51	33	..	22	24.740	55	17	39	51


TABLE OF LEADS (24.750 to 30.390)

Lead of Spiral in Inches	A	B	C	D	Lead of Spiral in Inches	A	B	C	D	Lead of Spiral in Inches	A	B	C	D
24.750	45	30	33	20	26.353	48	17	42	45	28.373	55	21	39	36
24.762	39	27	36	21	26.374	48	21	45	39	28.421	45	30	36	19
24.777	51	19	36	39	26.400	48	30	33	20	28.437	42	24	39	24
24.793	60	22	30	33	26.442	45	24	55	39	28.507	45	17	42	39
24.826	55	24	39	36	26.471	45	36	..	17	28.519	55	27	42	30
24.887	55	17	30	39	26.494	51	33	36	21	28.547	55	17	45	51
24.914	48	17	45	51	26.526	42	30	36	19	28.571	48	21	30	24
24.925	51	19	39	42	26.535	55	19	33	36	28.636	45	30	42	22
24.935	48	33	36	21	26.591	45	30	39	22	28.676	45	36	39	17
24.965	51	22	42	39	26.644	55	17	42	51	28.701	51	33	39	21
25.000	51	17	30	36	26.667	48	36	..	18	28.718	48	18	42	39
25.027	39	33	36	17	26.714	51	30	33	21	28.737	42	30	39	19
25.053	51	19	42	45	26.748	51	22	45	39	28.759	51	19	45	42
25.088	39	27	33	19	26.765	42	36	39	17	28.810	55	30	33	21
25.114	51	33	39	24	26.786	45	21	30	24	28.875	42	24	33	20
25.143	48	30	33	21	26.812	39	24	33	20	28.889	48	27	39	24
25.175	48	22	45	39	26.842	51	33	..	19	28.907	51	19	42	39
25.200	42	30	36	20	26.880	55	19	39	42	28.947	45	27	33	19
25.210	60	17	30	42	26.952	42	33	36	17	28.977	51	24	45	33
25.235	39	17	33	30	26.984	51	21	30	27	29.079	51	19	39	36
25.263	48	33	..	19	27.000	45	30	36	20	29.091	48	33	42	21
25.278	42	27	39	24	27.018	42	27	33	19	29.101	55	21	30	27
25.289	51	33	36	22	27.045	51	33	42	24	29.118	45	17	33	30
25.325	45	33	39	21	27.068	48	19	45	42	29.143	51	30	36	21
25.385	60	20	33	39	27.083	55	24	39	33	29.167	45	27	42	24
25.397	48	21	30	27	27.149	60	17	30	39	29.198	42	33	39	17
25.412	48	17	27	30	27.176	42	17	33	30	29.221	45	21	30	22
25.420	55	17	33	42	27.206	48	19	42	39	29.250	45	30	39	20
25.455	48	33	42	24	27.273	48	33	45	24	29.282	51	33	36	19
25.463	55	27	30	24	27.300	42	30	39	20	29.333	48	27	33	20
25.490	39	17	30	27	27.368	39	27	36	19	29.412	60	17	30	36
25.500	51	33	..	20	27.397	51	33	39	22	29.423	51	20	45	39
25.536	39	24	33	21	27.429	48	30	36	21	29.474	42	27	36	19
25.568	45	24	30	22	27.462	51	20	42	39	29.504	51	22	42	33
25.641	60	18	30	39	27.500	55	33	..	20	29.526	51	30	33	19
25.658	45	36	39	19	27.529	39	30	36	17	29.545	45	27	39	22
25.668	48	17	30	33	27.560	48	33	36	19	29.605	45	19	30	24
25.714	45	30	36	21	27.576	42	27	39	22	29.630	48	18	30	27
25.758	51	27	30	22	27.632	45	19	42	36	29.657	55	17	33	36
25.785	48	33	39	22	27.692	48	20	45	39	29.683	51	27	33	21
25.837	45	33	36	19	27.731	55	17	36	42	29.714	48	30	39	21
25.846	48	20	42	39	27.755	51	21	48	42	29.750	51	30	42	24
25.855	55	18	33	39	27.769	48	33	42	22	29.774	36	21	33	19
25.882	55	17	36	45	27.789	48	30	33	19	29.792	55	30	39	24
25.905	51	21	48	45	27.818	51	30	36	22	29.825	51	19	30	27
25.926	42	18	30	27	27.857	45	30	39	21	29.864	55	17	36	39
25.972	51	27	33	24	27.937	48	27	33	21	29.890	51	21	48	39
26.000	48	30	39	24	27.990	45	33	39	19	30.000	55	30	36	22
26.020	51	21	45	42	28.009	55	27	33	24	30.042	55	17	39	42
26.033	45	33	42	22	28.022	51	21	45	39	30.136	51	30	39	22
26.053	45	30	33	19	28.039	55	17	39	45	30.144	45	33	42	19
26.063	48	17	36	39	28.050	51	30	33	20	30.196	42	17	33	27
26.124	42	33	39	19	28.070	48	19	30	27	30.222	51	30	48	27
26.154	51	21	42	39	28.125	45	24	36	24	30.252	48	17	45	42
26.182	48	30	36	22	28.224	39	24	33	19	30.303	60	22	30	27
26.218	48	17	39	42	28.235	48	36	..	17	30.316	48	30	36	19
26.250	45	30	42	24	28.283	60	27	42	33	30.333	42	27	39	20
26.287	55	17	39	48	28.309	55	17	42	48	30.357	51	21	30	24
26.310	51	21	39	36	28.333	51	27	33	22	30.390	39	22	36	21

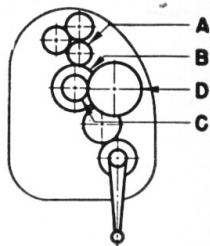


TABLE OF LEADS, STANDARD DRIVING MECHANISM

TABLE OF LEADS (30.407 to 37.227)

Lead of Spiral in Inches	A	B	C	D	Lead of Spiral in Inches	A	B	C	D	Lead of Spiral in Inches	A	B	C	D
30.407	48	17	42	39	32.566	45	24	33	19	34.895	51	30	39	19
30.450	55	17	48	51	32.579	48	17	45	39	34.921	55	27	36	21
30.476	48	27	36	21	32.692	51	18	45	39	35.000	48	24	42	24
30.513	51	18	42	39	32.727	51	33	36	17	35.049	55	17	39	36
30.545	48	30	42	22	32.738	55	21	30	24	35.065	45	22	36	21
30.556	55	24	36	27	32.807	51	27	33	19	35.079	51	27	39	21
30.588	39	17	36	27	32.842	48	30	39	19	35.088	60	19	30	27
30.600	51	30	36	20	32.906	55	18	42	39	35.188	39	21	36	19
30.643	39	20	33	21	32.941	42	27	36	17	35.256	55	18	45	39
30.677	51	19	48	42	33.000	48	24	33	20	35.294	45	27	36	17
30.694	51	27	39	24	33.016	48	27	39	21	35.325	51	21	48	33
30.769	48	18	45	39	33.036	51	19	48	39	35.357	45	21	33	20
30.789	45	30	39	19	33.056	51	27	42	24	35.368	48	30	42	19
30.802	48	33	36	17	33.088	45	17	30	24	35.380	55	27	33	19
30.882	45	36	42	17	33.117	51	21	30	22	35.417	51	27	45	24
30.909	51	27	36	22	33.158	45	30	42	19	35.455	42	22	39	21
30.937	45	24	33	20	33.239	45	24	39	22	35.526	45	24	36	19
30.952	45	27	39	21	33.277	36	17	33	21	35.556	48	27	42	21
30.972	51	19	45	39	33.333	55	27	36	22	35.588	55	17	33	30
31.023	42	24	39	22	33.369	48	33	39	17	35.648	55	27	42	24
31.059	48	17	33	30	33.393	51	24	33	21	35.686	42	27	39	17
31.111	48	27	42	24	33.429	39	21	36	20	35.700	51	30	42	20
31.167	51	27	33	20	33.485	51	27	39	22	35.714	60	21	30	24
31.200	48	30	39	20	33.553	51	19	30	24	35.750	55	20	39	30
31.250	60	24	30	24	33.589	39	22	36	19	35.795	45	24	42	22
31.283	45	33	39	17	33.611	55	27	33	20	35.921	42	24	39	19
31.316	51	19	42	36	33.684	48	27	36	19	35.936	48	17	42	33
31.360	55	19	39	36	33.704	42	27	39	18	35.948	55	17	30	27
31.385	51	20	48	39	33.719	51	22	48	33	35.962	51	20	55	39
31.429	55	30	36	21	33.750	45	24	36	20	36.000	51	30	36	17
31.481	51	18	30	27	33.772	55	19	42	36	36.012	55	24	33	21
31.500	45	30	42	20	33.846	48	20	55	39	36.050	39	17	33	21
31.515	48	27	39	22	33.868	39	19	33	20	36.061	51	27	42	22
31.544	39	17	33	24	33.882	48	30	36	17	36.096	45	17	30	22
31.571	51	30	39	21	33.939	48	27	42	22	36.111	55	27	39	22
31.612	51	22	45	33	33.951	55	18	30	27	36.172	42	22	36	19
31.722	51	33	39	19	33.971	42	17	33	24	36.184	55	19	45	36
31.746	60	21	30	27	34.000	51	30	48	24	36.364	48	27	45	22
31.765	45	30	36	17	34.048	55	30	39	21	36.397	45	17	33	24
31.818	45	27	42	22	34.091	55	22	45	33	36.429	51	30	45	21
31.842	55	30	33	19	34.125	42	24	39	20	36.474	42	19	33	20
31.875	51	30	45	24	34.163	51	19	42	33	36.491	48	27	39	19
31.909	39	22	36	20	34.211	45	27	39	19	36.562	45	24	39	20
31.930	42	27	39	19	34.249	51	21	55	39	36.603	51	19	45	33
32.000	48	21	42	30	34.286	48	24	36	21	36.667	55	27	36	20
32.011	55	27	33	21	34.375	55	30	45	24	36.706	48	30	39	17
32.083	42	18	33	24	34.412	45	30	39	17	36.818	45	22	36	20
32.118	42	30	39	17	34.450	48	19	30	22	36.842	55	19	42	33
32.143	45	24	36	21	34.510	48	17	33	27	36.908	51	24	33	19
32.164	55	19	30	27	34.531	51	24	39	24	36.923	51	17	48	39
32.211	51	30	36	19	34.615	51	17	45	39	36.947	39	20	36	19
32.231	60	22	39	33	34.630	51	18	33	27	36.975	55	17	48	42
32.256	39	19	33	21	34.667	48	27	39	20	37.037	60	18	30	27
32.297	45	19	30	22	34.711	60	22	42	33	37.059	45	30	42	17
32.308	51	17	42	39	34.737	48	19	33	24	37.091	51	22	48	30
32.353	45	17	33	27	34.773	51	30	45	22	37.143	48	24	39	21
32.381	51	27	36	21	34.821	45	24	39	21	37.187	51	24	42	24
32.455	51	30	42	22	34.842	55	17	42	39	37.218	45	21	33	19
32.500	48	24	39	24	34.872	51	18	48	39	37.227	42	22	39	20

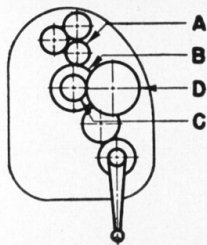


TABLE OF LEADS (37.240 to 46.324)

Lead of Spiral in Inches	A	B	C	D	Lead of Spiral in Inches	A	B	C	D	Lead of Spiral in Inches	A	B	C	D
37.240	55	24	39	24	40.000	51	27	36	17	43.105	42	20	39	19
37.321	60	19	39	33	40.071	51	21	33	20	43.137	55	27	36	17
37.346	55	18	33	27	40.104	55	24	42	24	43.175	51	27	48	21
37.403	48	22	36	21	40.147	42	24	39	17	43.214	55	21	33	20
37.500	55	24	36	22	40.191	60	19	42	33	43.308	48	21	36	19
37.540	39	17	36	22	40.263	51	24	36	19	43.333	51	27	39	17
37.579	51	30	42	19	40.428	42	22	36	17	43.421	55	19	36	24
37.632	55	19	39	30	40.441	55	17	45	36	43.466	51	24	45	22
37.647	48	27	36	17	40.476	51	27	45	21	43.618	51	24	39	19
37.670	51	24	39	22	40.519	48	22	39	21	43.636	48	22	42	21
37.714	48	21	33	20	40.568	51	24	42	22	43.651	55	21	45	27
37.745	55	17	42	36	40.602	45	21	36	19	43.676	45	17	33	20
37.778	51	27	48	24	40.625	60	24	39	24	43.714	51	21	36	20
37.812	55	24	33	20	40.741	55	27	42	21	43.750	60	24	42	24
37.831	55	27	39	21	40.765	42	17	33	20	43.797	42	22	39	17
37.853	39	17	33	20	40.784	48	27	39	17	43.923	51	22	36	19
37.895	48	30	45	19	40.800	51	20	48	30	43.985	45	21	39	19
37.917	42	24	39	18	40.909	60	20	30	22	44.000	48	18	33	20
37.987	45	22	39	21	40.926	51	27	39	18	44.074	51	27	42	18
38.182	48	24	42	22	41.053	48	24	39	19	44.118	60	17	30	24
38.194	55	27	45	24	41.143	48	21	36	20	44.136	55	18	39	27
38.235	45	27	39	17	41.176	45	27	42	17	44.211	48	24	42	19
38.250	51	24	36	20	41.212	51	27	48	22	44.289	51	20	33	19
38.487	45	24	39	19	41.250	55	24	36	20	44.318	60	24	39	22
38.500	55	20	42	30	41.270	60	21	39	27	44.370	48	17	33	21
38.519	48	27	39	18	41.294	39	17	36	20	44.444	48	27	45	18
38.571	45	21	36	20	41.340	48	22	36	19	44.471	42	20	36	17
38.596	55	27	36	19	41.364	42	22	39	18	44.485	55	17	33	24
38.636	51	27	45	22	41.437	51	24	39	20	44.524	51	18	33	21
38.756	45	22	36	19	41.481	48	27	42	18	44.571	48	21	39	20
38.772	51	27	39	19	41.597	45	17	33	21	44.625	51	24	42	20
38.824	48	17	33	24	41.667	55	27	45	22	44.687	55	24	39	20
38.857	51	30	48	21	41.684	48	19	33	20	44.737	51	27	45	19
38.889	60	24	42	27	41.711	60	17	39	33	44.785	48	22	39	19
38.958	51	18	33	24	41.727	51	22	36	20	44.920	60	17	42	33
39.000	51	30	39	17	41.754	51	27	42	19	45.000	55	22	36	20
39.043	51	19	48	33	41.786	45	21	39	20	45.029	55	19	42	27
39.079	45	20	33	19	41.813	55	27	39	19	45.205	51	22	39	20
39.187	42	22	39	19	41.905	48	18	33	21	45.215	45	22	42	19
39.216	60	17	30	27	41.986	45	22	39	19	45.294	55	17	42	30
39.273	48	22	36	20	42.000	48	24	42	20	45.333	51	27	48	20
39.286	55	22	33	21	42.014	55	18	33	24	45.378	45	21	36	17
39.298	48	27	42	19	42.059	55	17	39	30	45.455	60	22	45	27
39.328	39	17	36	21	42.105	48	27	45	19	45.474	48	20	36	19
39.375	45	24	42	20	42.180	51	21	33	19	45.489	55	21	33	19
39.394	60	22	39	27	42.308	55	17	51	39	45.500	42	20	39	18
39.464	51	24	39	21	42.353	48	30	45	17	45.536	51	24	45	21
39.474	55	19	45	33	42.424	60	22	42	27	45.614	60	19	39	27
39.529	48	30	42	17	42.500	51	27	45	20	45.714	48	21	36	18
39.542	55	17	33	27	42.545	48	22	39	20	45.818	48	22	42	20
39.667	51	27	42	20	42.560	55	24	39	21	45.833	55	24	48	24
39.699	48	21	33	19	42.632	45	20	36	19	45.882	48	24	39	17
39.722	55	27	39	20	42.778	55	27	42	20	45.975	45	17	33	19
39.740	51	22	36	21	42.910	42	17	33	19	46.015	51	21	36	19
39.789	42	20	36	19	42.947	51	19	48	30	46.042	51	24	39	18
39.803	55	24	33	19	42.969	55	24	45	24	46.184	45	20	39	19
39.819	55	17	48	39	43.015	45	24	39	17	46.203	48	22	36	17
39.845	39	17	33	19	43.052	51	22	39	21	46.316	48	18	33	19
39.886	45	22	39	20	43.062	60	19	30	22	46.324	45	24	42	17

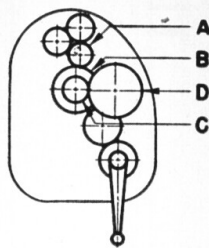
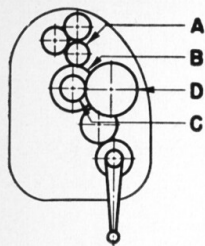


TABLE OF LEADS, STANDARD DRIVING MECHANISM

TABLE OF LEADS (46.364 to 60.662)

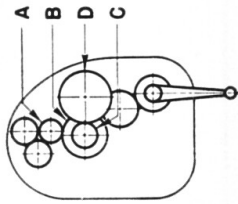
Lead of Spiral in Inches	A	B	C	D	Lead of Spiral in Inches	A	B	C	D	Lead of Spiral in Inches	A	B	C	D
46.364	51	24	48	22	50.155	45	19	36	17	54.643	51	21	45	20
46.429	60	24	39	21	50.227	51	22	39	18	54.678	55	19	51	27
46.561	55	21	48	27	50.329	51	24	45	19	54.737	48	19	39	18
46.588	48	17	33	20	50.370	51	27	48	18	54.902	60	17	42	27
46.667	51	27	42	17	50.417	55	18	33	20	55.000	55	24	48	20
46.732	55	27	39	17	50.526	48	21	42	19	55.059	48	20	39	17
46.753	48	21	45	22	50.649	60	22	39	21	55.250	51	20	39	18
46.811	42	17	36	19	50.712	42	19	39	17	55.263	55	22	42	19
46.875	60	24	45	24	50.794	60	21	48	27	55.462	55	21	36	17
46.925	45	22	39	17	50.824	48	20	36	17	55.556	60	18	45	27
46.974	51	24	42	19	50.840	55	17	33	21	55.588	45	20	42	17
47.039	55	24	39	19	50.909	48	22	42	18	55.636	51	22	48	20
47.059	48	27	45	17	50.926	55	18	45	27	55.655	55	24	51	21
47.143	55	21	36	20	50.980	60	17	39	27	55.714	60	21	39	20
47.222	51	27	45	18	51.000	51	24	48	20	55.981	60	22	39	19
47.273	48	22	39	18	51.071	55	21	39	20	56.000	48	20	42	18
47.357	51	21	39	20	51.136	60	22	45	24	56.140	60	19	48	27
47.531	55	18	42	27	51.244	51	19	42	22	56.192	55	17	33	19
47.584	51	22	39	19	51.316	55	22	39	19	56.250	55	22	45	20
47.619	60	21	45	27	51.429	48	21	45	20	56.368	51	20	42	19
47.647	45	20	36	17	51.462	55	19	48	27	56.447	55	20	39	19
47.719	51	27	48	19	51.562	55	24	45	20	56.471	48	21	42	17
47.763	55	20	33	19	51.618	45	20	39	17	56.618	55	24	42	17
47.812	51	24	45	20	51.675	48	22	45	19	56.667	51	24	48	18
47.895	42	19	39	18	51.852	60	18	42	27	56.746	55	21	39	18
48.000	48	21	42	20	51.944	55	20	51	27	56.842	51	19	36	17
48.016	55	18	33	21	52.000	48	20	39	18	57.143	55	22	48	21
48.125	55	24	42	20	52.105	55	20	36	19	57.273	60	22	42	20
48.148	60	18	39	27	52.159	51	22	45	20	57.292	55	24	45	18
48.176	42	20	39	17	52.342	51	20	39	19	57.353	55	22	39	17
48.230	48	22	42	19	52.381	55	24	48	21	57.519	51	21	45	19
48.246	55	19	45	27	52.437	48	21	39	17	57.716	55	18	51	27
48.316	51	20	36	19	52.500	55	22	42	20	57.754	48	22	45	17
48.403	48	21	36	17	52.574	55	24	39	17	57.895	55	24	48	19
48.485	60	22	48	27	52.632	60	19	45	27	57.957	48	19	39	17
48.529	55	24	36	17	52.941	48	24	45	17	58.158	51	19	39	18
48.571	51	24	48	21	52.987	51	22	48	21	58.235	55	20	36	17
48.698	55	24	51	24	53.053	48	20	42	19	58.286	51	21	48	20
48.750	55	22	39	20	53.070	55	18	33	19	58.333	55	22	42	18
48.889	55	20	48	27	53.125	55	24	51	22	58.437	55	24	51	20
49.040	48	17	33	19	53.182	60	22	39	20	58.500	51	20	39	17
49.091	51	22	36	17	53.333	51	27	48	17	58.514	45	19	42	17
49.107	55	24	45	21	53.382	55	17	33	20	58.565	51	22	48	19
49.123	60	19	42	27	53.472	55	24	42	18	58.647	60	21	39	19
49.160	45	21	39	17	53.498	48	19	36	17	58.824	60	17	45	27
49.211	55	19	51	30	53.529	42	18	39	17	58.929	55	21	45	20
49.263	48	20	39	19	53.571	55	22	45	21	58.947	48	19	42	18
49.412	60	17	42	30	53.684	51	24	48	19	59.091	60	22	39	18
49.471	55	21	51	27	53.759	55	21	39	19	59.211	55	22	45	19
49.500	51	17	33	20	53.904	48	22	42	17	59.259	60	18	48	27
49.524	48	21	39	18	53.922	55	17	45	27	59.294	48	20	42	17
49.583	51	24	42	18	54.000	51	20	36	17	59.500	51	20	42	18
49.624	55	21	36	19	54.091	51	22	42	18	59.583	55	20	39	18
49.653	55	24	39	18	54.135	48	21	45	19	60.000	60	21	42	20
49.675	51	22	45	21	54.167	55	22	39	18	60.084	55	21	39	17
49.737	45	20	42	19	54.276	55	19	45	24	60.287	60	19	42	22
49.850	51	21	39	19	54.321	55	18	48	27	60.395	51	20	45	19
50.000	55	24	48	22	54.334	45	19	39	17	60.504	48	21	45	17
50.053	48	22	39	17	54.545	60	22	48	24	60.662	55	17	45	24



CINCINNATI ML and MI MILLING MACHINES

TABLE OF LEADS (60.714 to 107.843)

Lead of Spiral in Inches	A	B	C	D	Lead of Spiral in Inches	A	B	C	D	Lead of Spiral in Inches	A	B	C	D
60.714	55	22	51	21	66.873	48	19	45	17	76.471	60	18	39	17
60.789	55	20	42	19	67.105	55	22	51	19	76.625	55	19	45	17
61.111	55	21	42	18	67.380	60	17	42	22	76.692	60	19	51	21
61.176	48	18	39	17	67.500	51	20	45	17	77.005	60	17	48	22
61.300	55	19	36	17	67.554	55	19	42	18	77.193	55	19	48	18
61.364	51	22	45	17	67.669	60	19	45	21	77.273	60	18	51	22
61.513	55	19	51	24	67.941	55	20	42	17	77.647	55	20	48	17
61.579	60	20	39	19	68.000	51	20	48	18	77.917	55	20	51	18
61.765	55	22	42	17	68.182	60	18	45	22	78.019	60	19	42	17
61.818	51	22	48	18	68.421	60	19	39	18	78.571	55	21	51	17
61.905	60	21	39	18	68.571	60	20	48	21	78.947	60	18	45	19
62.030	55	21	45	19	68.750	55	20	45	18	79.412	60	17	45	20
62.338	60	21	48	22	68.824	60	20	39	17	80.000	51	18	48	17
62.415	48	19	42	17	68.900	60	19	48	22	80.526	60	19	51	20
62.500	55	22	45	18	69.328	55	21	45	17	80.672	60	17	48	21
62.567	60	22	39	17	69.474	55	20	48	19	80.882	55	18	45	17
62.632	51	19	42	18	69.545	60	20	51	22	80.952	60	18	51	21
62.719	55	19	39	18	69.841	55	21	48	18	81.734	55	19	48	17
62.745	60	17	48	27	70.000	60	20	42	18	81.818	60	17	51	22
62.857	55	21	48	20	70.098	55	18	39	17	82.018	55	19	51	18
62.963	60	18	51	27	70.301	55	21	51	19	82.353	60	18	42	17
63.000	51	20	42	17	70.588	55	22	48	17	82.500	55	20	51	17
63.088	55	20	39	17	70.833	55	22	51	18	82.707	60	19	55	21
63.158	55	22	48	19	71.053	60	19	45	20	83.333	60	18	55	22
63.529	48	20	45	17	71.429	60	18	45	21	83.591	60	19	45	17
63.636	60	18	42	22	71.517	55	19	42	17	84.211	60	18	48	19
63.750	55	22	51	20	71.579	51	19	48	18	84.706	60	17	48	20
64.167	55	18	42	20	72.000	51	20	48	17	85.000	60	18	51	20
64.286	60	21	45	20	72.180	60	19	48	21	85.714	60	17	51	21
64.421	51	20	48	19	72.368	55	19	45	18	86.275	55	18	48	17
64.593	60	19	45	22	72.446	60	19	39	17	86.842	55	19	51	17
64.706	55	21	42	17	72.727	60	18	48	22	87.302	60	18	55	21
64.762	51	21	48	18	72.794	55	20	45	17	88.235	60	18	45	17
64.931	55	18	51	24	72.857	60	20	51	21	89.164	60	17	48	19
65.000	60	20	39	18	73.206	60	19	51	22	89.474	60	18	51	19
65.132	55	20	45	19	73.333	55	20	48	18	90.000	60	17	51	20
65.455	60	20	48	22	73.684	60	19	42	18	91.667	60	18	55	20
65.476	55	21	45	18	73.816	55	20	51	19	92.437	60	17	55	21
65.546	60	21	39	17	73.950	55	21	48	17	94.118	60	18	48	17
65.882	48	18	42	17	74.118	60	20	42	17	94.737	60	17	51	19
66.165	55	21	48	19	74.206	55	21	51	18	96.491	60	18	55	19
66.234	60	21	51	22	75.000	55	22	51	17	97.059	60	17	55	20
66.316	60	20	42	19	75.490	55	18	42	17	100.000	60	17	51	18
66.409	55	19	39	17	75.630	60	17	45	21	102.167	60	17	55	19
66.667	60	21	42	18	75.789	51	19	48	17	107.843	60	17	55	18
66.786	55	21	51	20	76.190	60	18	48	21					



LEADS, DIAMETERS AND ANGLES

TABLE OF CHANGE GEARS, APPROXIMATE ANGLES AND ENGLISH LEADS FOR CUTTING SPIRALS

Lead of Spiral Inches	A		B		C		D		DIAMETER OF WORK																									
	Driver	Driven	Driver	Driven	Driver	Driven	Driver	Driven	1/8 In.	1/4 In.	3/8 In.	1/2 In.	5/8 In.	3/4 In.	7/8 In.	1 In.	1 1/4 In.	1 1/2 In.	1 3/4 In.	2 In.	2 1/4 In.	2 1/2 In.	2 3/4 In.	3 In.	3 1/4 In.	3 1/2 In.	3 3/4 In.	4 In.	4 1/2 In.	5 In.	5 1/2 In.	6 In.		
2.50	27	48	45	20					8 3/4	17	25	32	38	43 1/4	44 3/4																			
2.78	20	48	45	30					8	15 1/2	23	29 1/2	35 1/4	40 1/2	44 3/4																			
2.92	21	48	45	30					7 1/2	15	23 1/4	28 1/4	34	39	43 1/4																			
3.24	27	48	33	19					6 3/4	13 1/4	19 3/4	25 3/4	31 1/4	36	40 1/2	44 1/4																		
3.70	27	42	33	19					6	11 3/4	17 1/2	23	28	32 1/2	36 1/2	40 1/2																		
3.89	30	45	36	21					5 1/2	11 1/4	16 3/4	22	26 3/4	31 1/4	35 1/4	39																		
4.17	39	51	33	18					5 1/4	10 1/2	15 3/4	20 1/2	25 1/4	29 1/2	33 1/2	37	43 1/4																	
4.46	39	51	36	21					4 3/4	9 3/4	14 3/4	19 1/4	23 3/4	27 3/4	31 1/2	35	39	44 1/4																
4.86	42	48	36	20					4 1/2	9	13 1/2	17 3/4	22	26 3/4	30 1/2	34 1/2	38 1/2	42 1/4																
5.33	33	39	27	17					4	8 1/4	12 1/4	16 1/2	20 1/4	23 3/4	27 1/4	30 1/2	33 1/2	36 1/2	40 1/4															
5.44	33	39	27	42					4	8	12	16	20	23 1/2	26 3/4	30	33 1/2	36 1/2	40 1/4															
6.12	27	42	21	20					3 1/2	7 1/4	11	14 1/2	17 3/4	21	24 1/4	27	33	37 3/4	42															
6.22	33	42	24	19					3 1/2	7	10 3/4	14 1/2	17 1/2	20 3/4	23 3/4	26 3/4	32 1/2	37 1/4	41 1/2															
6.48	42	48	36	20					3 1/4	6 3/4	10 1/4	13 1/2	16 3/4	20	23 1/2	26 3/4	30 1/2	33 1/2	36 1/2	40 1/4	44 1/4													
6.67	30	36	27	20					3 1/4	6 1/2	9 1/4	12 1/4	15 1/4	18 1/4	21 1/4	24 1/4	27 1/4	30 1/2	33 1/2	36 1/2	40 1/4	43 1/2												
7.29	45	27	36	...					3	6 1/4	9 1/4	12 1/4	15 1/4	18 1/4	21 1/4	24 1/4	27 1/4	30 1/2	33 1/2	36 1/2	40 1/4	43 1/2	44 1/4											
7.41	51	30	17	39					3	6	9	12	14 3/4	17 3/4	20 3/4	23 3/4	26 3/4	29 1/2	32 1/2	35 1/2	38 1/2	41 1/2	44 1/4											
7.62	45	22	19	...					2 3/4	5 3/4	8 3/4	11 1/2	14 1/2	17 1/4	19 3/4	22 1/4	24 1/4	27 1/4	30 1/2	33 1/2	36 1/2	39 1/2	42 1/4	45										
8.33	30	39	33	...					2 1/2	5 1/4	8	10 1/2	13 1/4	15 3/4	18 1/4	20 1/2	22 1/2	25 1/2	28 1/2	31 1/2	34 1/2	37 1/2	40 1/2	43 1/2										
8.95	48	33	24	36					2 1/2	5	7 1/2	10	12 1/2	14 3/4	17	19 1/4	21 1/4	23 1/4	25 1/4	28 1/4	31 1/4	34 1/4	37 1/4	40 1/4	43 1/4									
9.33	42	36	24	27					2 1/4	4 3/4	7 1/4	9 1/4	11 1/4	13 3/4	16 1/4	18 1/4	20 1/4	22 1/4	24 1/4	26 1/4	28 1/4	30 1/4	32 1/4	34 1/4	36 1/4	38 1/4	40 1/4	42 1/4	44 1/4	45				
9.52	33	39	24	27					2	4 1/4	6 1/2	8 3/4	10 3/4	12 3/4	15	17 1/4	19 1/4	21 1/4	23 1/4	25 1/4	27 1/4	29 1/4	31 1/4	33 1/4	35 1/4	37 1/4	39 1/4	41 1/4	42 1/2	45				
10.29	39	36	20	19					2	4 1/4	6 1/2	8 3/4	10 3/4	12 3/4	14 3/4	17	19 1/4	21 1/4	23 1/4	25 1/4	27 1/4	29 1/4	31 1/4	33 1/4	35 1/4	37 1/4	39 1/4	41 1/4	42 1/2	44 3/4				
10.37	42	36	27	24					2	4 1/4	6 1/2	8 3/4	10 3/4	12 3/4	14 3/4	17	19 1/4	21 1/4	23 1/4	25 1/4	27 1/4	29 1/4	31 1/4	33 1/4	35 1/4	37 1/4	39 1/4	41 1/4	42 1/2	44 3/4				
10.50	21	45	45	...					2	4	6 1/4	8 1/4	10 1/4	12 1/4	14 1/4	16 1/4	18 1/4	20 1/4	22 1/4	24 1/4	26 1/4	28 1/4	30 1/4	32 1/4	34 1/4	36 1/4	38 1/4	40 1/4	42 1/2	44 3/4				
10.67	55	27	22	22					2	4	6	8 1/4	10 1/4	12 1/4	14 1/4	16 1/4	18 1/4	20 1/4	22 1/4	24 1/4	26 1/4	28 1/4	30 1/4	32 1/4	34 1/4	36 1/4	38 1/4	40 1/4	42 1/2	44 3/4				
10.94	48	27	24	39					2	4	6	8 1/4	10 1/4	12 1/4	14 1/4	16 1/4	18 1/4	20 1/4	22 1/4	24 1/4	26 1/4	28 1/4	30 1/4	32 1/4	34 1/4	36 1/4	38 1/4	40 1/4	42 1/2	44 3/4				
11.11	30	39	39	...					2	4	6	8 1/4	10 1/4	12 1/4	14 1/4	16 1/4	18 1/4	20 1/4	22 1/4	24 1/4	26 1/4	28 1/4	30 1/4	32 1/4	34 1/4	36 1/4	38 1/4	40 1/4	42 1/2	44 3/4				
11.66	36	19	24	39					1 3/4	3 3/4	5 3/4	7 1/2	9 1/2	11 1/4	13 1/4	15 1/4	17 1/4	19 1/4	21 1/4	23 1/4	25 1/4	27 1/4	29 1/4	31 1/4	33 1/4	35 1/4	37 1/4	39 1/4	41 1/4	42 1/2	44 3/4			
12.00	36	39	39	...					1 3/4	3 3/4	5 1/2	7 1/2	9 1/2	11 1/4	13 1/4	15 1/4	17 1/4	19 1/4	21 1/4	23 1/4	25 1/4	27 1/4	29 1/4	31 1/4	33 1/4	35 1/4	37 1/4	39 1/4	41 1/4	42 1/2	44 3/4			
13.12	36	39	27	...					1 1/2	3 1/4	5 1/4	6 3/4	8 1/4	10 1/4	12 1/4	14 1/4	16 1/4	18 1/4	20 1/4	22 1/4	24 1/4	26 1/4	28 1/4	30 1/4	32 1/4	34 1/4	36 1/4	38 1/4	40 1/4	42 1/2	44 3/4			
13.33	48	33	33	...					1 1/2	3 1/4	5	6 3/4	8 1/4	10 1/4	12 1/4	14 1/4	16 1/4	18 1/4	20 1/4	22 1/4	24 1/4	26 1/4	28 1/4	30 1/4	32 1/4	34 1/4	36 1/4	38 1/4	40 1/4	42 1/2	44 3/4			
13.71	48	45	21	27					1 1/2	3 1/4	4 3/4	6 1/2	8 1/2	10 1/4	12 1/4	14 1/4	16 1/4	18 1/4	20 1/4	22 1/4	24 1/4	26 1/4	28 1/4	30 1/4	32 1/4	34 1/4	36 1/4	38 1/4	40 1/4	42 1/2	44 3/4	46 3/4	49 1/4	52 1/4

Approximate Angle in Degrees for setting Milling Machine Table.

These tables are of special convenience for quickly setting the machine with proper change gears when the angle of spiral and the diameter of a piece of work are known. For example: To cut a drum cam 2" diameter, 28° angle: Follow down the 2" column to the nearest angle, 27 3/4, and the change gears are 36, 39, and 30.

See pages 65-66 for lead and angle formulae

Approximate Angle in Degrees for setting Milling Machine Table.

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See pages 65-66 for lead and angle formulae

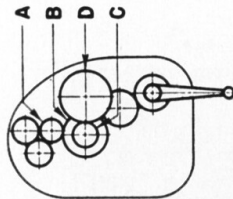
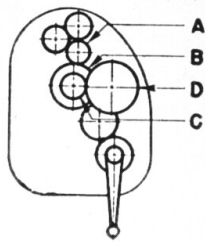


TABLE OF CHANGE GEARS, APPROXIMATE ANGLES, AND ENGLISH LEADS
FOR CUTTING SPIRALS—(Concluded)

Lead of Spiral Inches	A Driven	B Driver	C Driven	D Driver	DIAMETER OF WORK																											
					7/8 In.	1/4 In.	3/8 In.	1/2 In.	5/8 In.	3/4 In.	7/8 In.	1 In.	1 1/4 In.	1 1/2 In.	1 3/4 In.	2 In.	2 1/4 In.	2 1/2 In.	2 3/4 In.	3 In.	3 1/4 In.	3 1/2 In.	3 3/4 In.	4 In.	4 1/2 In.	5 In.	5 1/2 In.	6 In.				
15.24	45	17	19	33	1 1/2	3	4 1/2	5 3/4	7 1/4	8 3/4	10 1/4	11 3/4	14 1/2	17 1/4	20	22 1/2	25	27 1/4	29 1/2	31 3/4	34	35 3/4	37 3/4	39 1/2	42 3/4	46	48 1/2	51				
15.56	42	36	.....	27	1 1/4	2 3/4	4 1/4	5 3/4	7 1/4	8 3/4	10	11 1/2	14 1/4	17	19 1/2	22	24 1/2	27	29	31 1/4	33 1/4	35 1/4	37	39	42 1/4	45 1/4	48	50 1/2				
15.75	42	24	27	30	1 1/4	2 3/4	4 1/4	5 1/2	7	8 1/2	9 3/4	11 1/4	14	16 3/4	19 1/4	21 3/4	24 1/2	26 1/2	28 3/4	31	33	35	36 3/4	38 1/2	42	45	47 1/2	50				
16.87	45	24	27	30	1 1/4	2 1/2	4	5 1/4	6 3/4	7 3/4	9 1/4	10 1/2	13 1/4	15 3/4	18 1/4	20 1/2	22 3/4	25	27 1/4	29 1/4	31 1/4	33 1/4	35	36 1/2	39 3/4	43	45 3/4	48 1/4				
17.14	36	39	.....	21	1 1/4	2 1/2	4	5 1/4	6 1/2	7 1/4	8 1/4	10 1/4	13	15 1/2	17 3/4	20 1/2	22 3/4	24 3/4	26 3/4	29	30 3/4	32 3/4	34 1/2	36	39 1/2	42 1/2	45 1/4	47 3/4				
18.75	45	36	.....	24	1	2 1/4	3 1/2	4 3/4	6	7 1/4	8 1/4	9 1/2	12	14 1/4	16 1/4	18 1/2	20 3/4	22 3/4	25	26 3/4	28 1/2	30 1/2	32 3/4	34 1/2	37	39 3/4	42 3/4	45				
19.29	45	21	27	30	1	2 1/4	3 1/2	4 1/2	5 3/4	7	8	9 1/4	11 1/2	13 3/4	16	18 1/4	20 1/4	22 1/4	24	26	28	29 3/4	31 1/2	33	36 1/4	38 3/4	42	44 1/2				
19.59	48	21	36	42	1	2 1/4	3 1/4	4 1/2	5 3/4	6 3/4	8	9 1/4	11 1/2	13 1/2	15 3/4	18	20	22	23 3/4	25 3/4	27 1/2	29 1/4	31	32 3/4	35 3/4	38 3/4	41 1/2	44				
19.69	51	19	33	45	1	2 1/4	3 1/4	4 1/2	5 3/4	6 3/4	8	9	11 1/2	13 3/4	15 3/4	17 3/4	20	21 3/4	23 3/4	25 1/2	27 1/2	29 1/4	31	32 3/4	35 3/4	38 1/4	41 1/4	43 3/4				
21.43	45	36	.....	21	1	2	3 1/4	4 1/4	5 1/4	6 1/4	7 1/2	8 1/2	10 1/2	12 1/2	14 1/2	16 1/2	18 1/2	20 1/2	22	23 3/4	25 1/2	27 1/4	29	30 3/4	33 1/2	36 1/4	38 3/4	41 1/4				
22.50	45	36	.....	20	1	2	3	4	6	7	8	10	12	13 3/4	15 3/4	17 1/2	19 1/4	21 1/4	22	23 3/4	24 1/2	26 1/2	27 3/4	29 1/4	32 1/4	35	37 1/2	40				
23.33	42	36	.....	18	1	2	3	4	5	5 3/4	6 3/4	7 3/4	9 3/4	11 1/2	13 1/4	15 1/4	17	18 3/4	20 1/4	22	23 1/2	25 1/4	27	28 1/4	31 1/4	34	36 3/4	39				
26.25	45	30	42	24	1	1 3/4	2 3/4	3 1/2	4 1/4	5	6	7	8 1/2	10 1/4	12	13 1/2	15	16 3/4	18 1/4	19 3/4	21 1/4	22 3/4	24 1/4	25 1/2	28 1/4	31	33 1/4	35 3/4				
26.67	48	36	.....	18	1	1 3/4	2 3/4	3 1/2	4 1/4	5	6	6 3/4	8 1/2	10 1/4	11 3/4	13 1/4	14 3/4	16 1/2	18	19 1/2	21	22 1/4	23 3/4	25 1/4	28	30 1/2	33	35 1/4				
28.00	48	30	42	30	1 3/4	1 3/4	2 1/2	3 1/4	4 1/4	5 3/4	6 3/4	7 3/4	8 1/2	10 1/4	11 1/4	12 3/4	14 1/4	15 3/4	17 1/2	18 3/4	20	21 1/2	22 3/4	24	26 3/4	29 1/4	31 3/4	34				
30.88	45	36	42	17	3 1/4	1 1/2	2 1/4	3 3/4	4 1/2	5 3/4	6 3/4	7 3/4	8 1/2	10 1/4	11 1/2	13 1/4	14 1/4	15 1/2	17 1/4	18 3/4	20	21 1/2	22 3/4	24	26 3/4	29 1/4	31 3/4	34				
31.50	45	30	42	20	3 1/4	1 1/2	2 1/4	3	3 1/2	4 1/4	5	5 3/4	7 1/4	8 1/2	10	11 1/4	12 3/4	14	15 1/4	16 1/2	18	19 1/4	20 1/2	21 3/4	24 1/4	26 1/2	28 3/4	31				
36.00	51	30	36	17	1 1/2	1 1/4	2	2 1/2	3 1/4	3 3/4	4 1/2	5	6 1/4	7 1/2	8 3/4	10	11	12 1/4	13 1/2	14 3/4	16	17	18 1/4	19 1/4	21 1/2	23 1/2	25 3/4	27 3/4				
41.14	48	21	36	20	1 1/2	1	1 3/4	2 1/4	2 3/4	3 1/4	4	4 1/2	5 1/2	6 1/2	7 3/4	8 3/4	9 3/4	10 3/4	11 3/4	13	14	15	16	17	19	21	22 3/4	24 1/2				
45.00	55	22	36	20	1 1/2	1	1 1/2	2	2 1/2	3	3 1/2	4	5	6	7	8	9	10	11 1/4	12 3/4	14 3/4	15 1/2	17 1/2	19 1/4	21	22 3/4	24 1/2	26 1/2				
48.00	48	21	42	20	1 1/2	1	1 1/2	2	2 1/4	2 3/4	3	3 1/2	4 1/2	5 1/4	6 1/2	7 1/2	8 1/2	9 1/4	10 1/4	11 1/4	12 3/4	14 3/4	15 1/2	17 1/2	19 1/4	21	22 3/4	24 1/2				
51.43	48	21	45	20	1 1/2	3/4	1 1/2	1 3/4	2 1/4	2 3/4	3	3 1/2	4 1/2	5 1/4	6	7	8 1/2	9 1/2	10 1/4	11 1/4	12	13 3/4	14 3/4	16 1/2	18	19 3/4	21 1/2	22 1/4				
60.00	60	21	42	20	1 1/2	3/4	1 1/4	1 1/2	2	2 1/4	2 3/4	3	3 1/2	4 1/2	5 1/4	6	7	8 1/2	9 1/2	10 1/4	11 1/4	12	13 3/4	14 3/4	16	17 1/2	18 1/2	20				
63.00	51	20	42	17	1 1/4	3/4	1	1 1/2	2	2 1/4	2 3/4	3	3 1/2	4 1/2	5 1/4	6	7	8 1/2	9 1/2	10 1/4	11 1/4	12	13 3/4	14 3/4	16	17 1/2	18 1/2	20				
65.00	60	20	39	18	1 1/4	3/4	1	1 1/2	2	2 1/4	2 3/4	3	3 1/2	4 1/2	5 1/4	6	7	8 1/2	9 1/2	10 1/4	11 1/4	12	13 3/4	14 3/4	16	17 1/2	18 1/2	20				
70.00	60	20	42	18	1 1/4	3/4	1	1 1/2	2	2 1/4	2 3/4	3	3 1/2	4 1/2	5 1/4	6	7	8 1/2	9 1/2	10 1/4	11 1/4	12	13 3/4	14 3/4	16	17 1/2	18 1/2	20				
72.00	51	20	48	17	1 1/4	3/4	1	1 1/2	2	2 1/4	2 3/4	3	3 1/2	4 1/2	5 1/4	6	7	8 1/2	9 1/2	10 1/4	11 1/4	12	13 3/4	14 3/4	16	17 1/2	18 1/2	20				
75.00	55	22	51	17	1 1/4	1 1/2	1	1 1/4	1 1/2	1 3/4	2	2 1/4	2 3/4	3 1/2	4 1/2	5 1/4	6 1/4	7 1/2	8 3/4	9 1/2	10 1/4	11 1/4	12	13 3/4	14 3/4	16	17 1/2	18 1/2				
80.00	51	18	48	17	1 1/4	1 1/4	1 1/2	1 1/4	1 1/2	1 3/4	2	2 1/4	2 3/4	3 1/2	4 1/2	5 1/4	6 1/4	7 1/2	8 3/4	9 1/2	10 1/4	11 1/4	12	13 3/4	14 3/4	16	17 1/2	18 1/2				
85.00	60	18	51	17	1 1/4	1 1/4	1 1/2	1 1/4	1 1/2	1 3/4	2	2 1/4	2 3/4	3 1/2	4 1/2	5 1/4	6 1/4	7 1/2	8 3/4	9 1/2	10 1/4	11 1/4	12	13 3/4	14 3/4	16	17 1/2	18 1/2				
90.00	60	17	51	20	1 1/4	1 1/2	1 1/4	1 1/2	1 1/4	1 1/2	1 3/4	2	2 1/4	2 3/4	3 1/2	4 1/2	5 1/4	6 1/4	7 1/2	8 3/4	9 1/2	10 1/4	11 1/4	12	13 3/4	14 3/4	16	17 1/2				
100.00	60	17	51	18	1 1/4	1 1/2	1 1/4	1 1/2	1 1/4	1 1/2	1 3/4	2	2 1/4	2 3/4	3 1/2	4 1/2	5 1/4	6 1/4	7 1/2	8 3/4	9 1/2	10 1/4	11 1/4	12	13 3/4	14 3/4	16	17 1/2				
107.80	60	17	55	18	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2				



TABLES FOR MAKING MILLING CUTTERS

ENGLISH LEADS AND CHANGE GEARS FOR MILLING SPIRAL END MILLS

Set Machine Table to Angle of Approximately 20 Degrees

Diameter of Mill, Inches	Lead in Inches	Driven A	Driver B	Driven C	Driver D
$\frac{3}{8}$	3.24	27	33	19	48
$\frac{1}{2}$	4.32	36	33	19	48
$\frac{5}{8}$	5.40	45	33	19	48
$\frac{3}{4}$	6.48	42	27	20	48
$\frac{7}{8}$	7.56	42	22	19	48
1	8.64	42	27	20	36
$1\frac{1}{8}$	9.72	45	27	21	36
$1\frac{1}{4}$	10.79	36	20	27	45
$1\frac{3}{8}$	11.87	36	21	27	39
$1\frac{1}{2}$	12.94	22	45		17
$1\frac{3}{4}$	15.11	48	22	27	39
2	17.26	51	19	27	42
$2\frac{1}{4}$	19.41	33	36		17
$2\frac{1}{2}$	21.58	51	20	33	39
$2\frac{3}{4}$	23.73	55	17	22	30
3	25.88	55	17	36	45
$3\frac{1}{4}$	28.05	51	30	33	20
$3\frac{1}{2}$	30.22	51	30	48	27
$3\frac{3}{4}$	32.38	51	27	36	21
4	34.53	51	24	39	24

ENGLISH LEADS AND CHANGE GEARS FOR MILLING SPIRAL MILLING CUTTERS

Set Machine Table to Angle of Approximately 25 Degrees

Diameter of Mill, Inches	Lead in Inches	Driven A	Driver B	Driven C	Driver D
$\frac{1}{2}$	3.37	27	33	21	51
$\frac{5}{8}$	4.22	27	24	18	48
$\frac{3}{4}$	5.05	30	33	20	36
$\frac{7}{8}$	5.89	33	36	27	42
1	6.74	39	27	21	45
$1\frac{1}{4}$	8.42	48	19	17	51
$1\frac{1}{2}$	10.11	42	22	27	51
$1\frac{3}{4}$	11.79	42	19	42	45
2	13.47	36	21	33	42
$2\frac{1}{4}$	15.16	48	19	27	45
$2\frac{1}{2}$	16.84	48	19	30	45
$2\frac{3}{4}$	18.53	42	17	36	48
3	20.20	60	27	30	33
$3\frac{1}{4}$	21.90	48	19	39	45
$3\frac{1}{2}$	23.58	48	19	42	45
$3\frac{3}{4}$	25.26	48	33		19
4	26.95	42	33	36	17
$4\frac{1}{4}$	28.63	51	19	48	45
$4\frac{1}{2}$	30.32	48	30	36	19
$4\frac{3}{4}$	32.00	48	21	42	30
5	33.69	45	33	42	17
$5\frac{1}{4}$	35.37	48	30	42	19
$5\frac{1}{2}$	37.06	45	30	42	17
$5\frac{3}{4}$	38.76	45	22	36	19
6	40.43	42	22	36	17

TABLE OF TANGENTS
(Natural Tangents at Intervals of $\frac{1}{4}^\circ$)

Degrees	Tangent	Degrees	Tangent	Degrees	Tangent	Degrees	Tangent	Degrees	Tangent	Degrees	Tangent	Degrees	Tangent
0°	.0000	13°	.2309	26°	.4877	39°	.8098	52°	1.280	65°	2.145	78°	4.705
$\frac{1}{4}$	.0044	$13\frac{1}{4}$	.2355	$26\frac{1}{4}$	.4931	$39\frac{1}{4}$	.8170	$52\frac{1}{4}$	1.292	$65\frac{1}{4}$	2.169	$78\frac{1}{4}$	4.808
$\frac{1}{2}$	.0087	$13\frac{1}{2}$	.2401	$26\frac{1}{2}$	.4986	$39\frac{1}{2}$	.8243	$52\frac{1}{2}$	1.303	$65\frac{1}{2}$	2.194	$78\frac{1}{2}$	4.915
$\frac{3}{4}$	.0131	$13\frac{3}{4}$	.2447	$26\frac{3}{4}$	.5040	$39\frac{3}{4}$	.8317	$52\frac{3}{4}$	1.315	$65\frac{3}{4}$	2.220	$78\frac{3}{4}$	5.027
1°	.0175	14°	.2493	27°	.5095	40°	.8391	53°	1.327	66°	2.246	79°	5.145
$1\frac{1}{4}$	.0218	$14\frac{1}{4}$	.2540	$27\frac{1}{4}$	.5150	$40\frac{1}{4}$	.8466	$53\frac{1}{4}$	1.339	$66\frac{1}{4}$	2.273	$79\frac{1}{4}$	5.267
$1\frac{1}{2}$	.0262	$14\frac{1}{2}$	.2586	$27\frac{1}{2}$	.5206	$40\frac{1}{2}$	.8541	$53\frac{1}{2}$	1.351	$66\frac{1}{2}$	2.300	$79\frac{1}{2}$	5.396
$1\frac{3}{4}$	.0306	$14\frac{3}{4}$	.2633	$27\frac{3}{4}$	.5261	$40\frac{3}{4}$	.8617	$53\frac{3}{4}$	1.364	$66\frac{3}{4}$	2.328	$79\frac{3}{4}$	5.530
2°	.0349	15°	.2680	28°	.5317	41°	.8693	54°	1.376	67°	2.356	80°	5.671
$2\frac{1}{4}$	.0393	$15\frac{1}{4}$	.2726	$28\frac{1}{4}$	.5373	$41\frac{1}{4}$	.8770	$54\frac{1}{4}$	1.389	$67\frac{1}{4}$	2.385	$80\frac{1}{4}$	5.820
$2\frac{1}{2}$	.0437	$15\frac{1}{2}$	.2773	$28\frac{1}{2}$	.5430	$41\frac{1}{2}$	.8847	$54\frac{1}{2}$	1.402	$67\frac{1}{2}$	2.414	$80\frac{1}{2}$	5.976
$2\frac{3}{4}$	.0480	$15\frac{3}{4}$	.2820	$28\frac{3}{4}$	.5486	$41\frac{3}{4}$	.8925	$54\frac{3}{4}$	1.415	$67\frac{3}{4}$	2.444	$80\frac{3}{4}$	6.140
3°	.0524	16°	.2867	29°	.5543	42°	.9004	55°	1.428	68°	2.475	81°	6.314
$3\frac{1}{4}$	.0568	$16\frac{1}{4}$	.2915	$29\frac{1}{4}$	.5600	$42\frac{1}{4}$	.9083	$55\frac{1}{4}$	1.442	$68\frac{1}{4}$	2.507	$81\frac{1}{4}$	6.497
$3\frac{1}{2}$	.0612	$16\frac{1}{2}$	.2962	$29\frac{1}{2}$	.5658	$42\frac{1}{2}$	.9163	$55\frac{1}{2}$	1.455	$68\frac{1}{2}$	2.539	$81\frac{1}{2}$	6.691
$3\frac{3}{4}$	.0655	$16\frac{3}{4}$	.3010	$29\frac{3}{4}$	.5716	$42\frac{3}{4}$	.9244	$55\frac{3}{4}$	1.469	$68\frac{3}{4}$	2.572	$81\frac{3}{4}$	6.897
4°	.0699	17°	.3057	30°	.5774	43°	.9325	56°	1.483	69°	2.605	82°	7.115
$4\frac{1}{4}$	.0743	$17\frac{1}{4}$	.3105	$30\frac{1}{4}$	.5832	$43\frac{1}{4}$	.9407	$56\frac{1}{4}$	1.497	$69\frac{1}{4}$	2.639	$82\frac{1}{4}$	7.348
$4\frac{1}{2}$	.0787	$17\frac{1}{2}$	.3153	$30\frac{1}{2}$	.5890	$43\frac{1}{2}$	.9490	$56\frac{1}{2}$	1.511	$69\frac{1}{2}$	2.675	$82\frac{1}{2}$	7.596
$4\frac{3}{4}$	.0831	$17\frac{3}{4}$	.3201	$30\frac{3}{4}$	.5949	$43\frac{3}{4}$	.9573	$56\frac{3}{4}$	1.525	$69\frac{3}{4}$	2.711	$82\frac{3}{4}$	7.861
5°	.0875	18°	.3249	31°	.6009	44°	.9657	57°	1.540	70°	2.748	83°	8.144
$5\frac{1}{4}$	.0919	$18\frac{1}{4}$	.3298	$31\frac{1}{4}$	.6068	$44\frac{1}{4}$	.9742	$57\frac{1}{4}$	1.555	$70\frac{1}{4}$	2.785	$83\frac{1}{4}$	8.449
$5\frac{1}{2}$	.0963	$18\frac{1}{2}$	.3346	$31\frac{1}{2}$	.6128	$44\frac{1}{2}$	.9827	$57\frac{1}{2}$	1.570	$70\frac{1}{2}$	2.824	$83\frac{1}{2}$	8.777
$5\frac{3}{4}$	.1007	$18\frac{3}{4}$	.3395	$31\frac{3}{4}$	.6188	$44\frac{3}{4}$	.9913	$57\frac{3}{4}$	1.585	$70\frac{3}{4}$	2.864	$83\frac{3}{4}$	9.131
6°	.1051	19°	.3443	32°	.6249	45°	1.000	58°	1.600	71°	2.904	84°	9.514
$6\frac{1}{4}$	.1095	$19\frac{1}{4}$	.3492	$32\frac{1}{4}$	.6310	$45\frac{1}{4}$	1.009	$58\frac{1}{4}$	1.616	$71\frac{1}{4}$	2.946	$84\frac{1}{4}$	9.931
$6\frac{1}{2}$	.1139	$19\frac{1}{2}$	.3541	$32\frac{1}{2}$	.6371	$45\frac{1}{2}$	1.018	$58\frac{1}{2}$	1.632	$71\frac{1}{2}$	2.989	$84\frac{1}{2}$	10.385
$6\frac{3}{4}$	.1184	$19\frac{3}{4}$	.3590	$32\frac{3}{4}$	.6432	$45\frac{3}{4}$	1.027	$58\frac{3}{4}$	1.648	$71\frac{3}{4}$	3.033	$84\frac{3}{4}$	10.883
7°	.1228	20°	.3640	33°	.6494	46°	1.036	59°	1.664	72°	3.078	85°	11.430
$7\frac{1}{4}$	.1272	$20\frac{1}{4}$	.3689	$33\frac{1}{4}$	.6556	$46\frac{1}{4}$	1.045	$59\frac{1}{4}$	1.681	$72\frac{1}{4}$	3.124	$85\frac{1}{4}$	12.035
$7\frac{1}{2}$	.1317	$20\frac{1}{2}$	.3739	$33\frac{1}{2}$	.6619	$46\frac{1}{2}$	1.054	$59\frac{1}{2}$	1.698	$72\frac{1}{2}$	3.172	$85\frac{1}{2}$	12.706
$7\frac{3}{4}$	.1361	$20\frac{3}{4}$	.3789	$33\frac{3}{4}$	.6682	$46\frac{3}{4}$	1.063	$59\frac{3}{4}$	1.715	$72\frac{3}{4}$	3.221	$85\frac{3}{4}$	13.457
8°	.1405	21°	.3839	34°	.6745	47°	1.072	60°	1.732	73°	3.271	86°	14.301
$8\frac{1}{4}$	.1450	$21\frac{1}{4}$	.3889	$34\frac{1}{4}$	.6809	$47\frac{1}{4}$	1.082	$60\frac{1}{4}$	1.750	$73\frac{1}{4}$	3.323	$86\frac{1}{4}$	15.257
$8\frac{1}{2}$	.1495	$21\frac{1}{2}$	.3939	$34\frac{1}{2}$	.6873	$47\frac{1}{2}$	1.091	$60\frac{1}{2}$	1.768	$73\frac{1}{2}$	3.376	$86\frac{1}{2}$	16.350
$8\frac{3}{4}$	.1539	$21\frac{3}{4}$	.3990	$34\frac{3}{4}$	.6937	$47\frac{3}{4}$	1.101	$60\frac{3}{4}$	1.786	$73\frac{3}{4}$	3.431	$86\frac{3}{4}$	17.610
9°	.1584	22°	.4040	35°	.7002	48°	1.111	61°	1.804	74°	3.487	87°	19.081
$9\frac{1}{4}$	.1629	$22\frac{1}{4}$	.4091	$35\frac{1}{4}$	.7067	$48\frac{1}{4}$	1.120	$61\frac{1}{4}$	1.823	$74\frac{1}{4}$	3.546	$87\frac{1}{4}$	20.819
$9\frac{1}{2}$	.1673	$22\frac{1}{2}$	.4142	$35\frac{1}{2}$	.7133	$48\frac{1}{2}$	1.130	$61\frac{1}{2}$	1.842	$74\frac{1}{2}$	3.606	$87\frac{1}{2}$	22.904
$9\frac{3}{4}$	.1718	$22\frac{3}{4}$	.4193	$35\frac{3}{4}$	.7199	$48\frac{3}{4}$	1.140	$61\frac{3}{4}$	1.861	$74\frac{3}{4}$	3.668	$87\frac{3}{4}$	24.452
10°	.1763	23°	.4245	36°	.7265	49°	1.150	62°	1.881	75°	3.732	88°	28.636
$10\frac{1}{4}$	.1808	$23\frac{1}{4}$	.4296	$36\frac{1}{4}$	.7332	$49\frac{1}{4}$	1.161	$62\frac{1}{4}$	1.901	$75\frac{1}{4}$	3.798	$88\frac{1}{4}$	32.730
$10\frac{1}{2}$	.1853	$23\frac{1}{2}$	.4348	$36\frac{1}{2}$	.7400	$49\frac{1}{2}$	1.171	$62\frac{1}{2}$	1.921	$75\frac{1}{2}$	3.867	$88\frac{1}{2}$	38.188
$10\frac{3}{4}$	.1899	$23\frac{3}{4}$	.4400	$36\frac{3}{4}$	.7467	$49\frac{3}{4}$	1.181	$62\frac{3}{4}$	1.942	$75\frac{3}{4}$	3.938	$88\frac{3}{4}$	45.829
11°	.1944	24°	.4452	37°	.7536	50°	1.192	63°	1.963	76°	4.011	89°	57.29
$11\frac{1}{4}$	.1989	$24\frac{1}{4}$	.4505	$37\frac{1}{4}$	.7604	$50\frac{1}{4}$	1.202	$63\frac{1}{4}$	1.984	$76\frac{1}{4}$	4.087	$89\frac{1}{4}$	76.39
$11\frac{1}{2}$	.2035	$24\frac{1}{2}$	.4557	$37\frac{1}{2}$	.7673	$50\frac{1}{2}$	1.213	$63\frac{1}{2}$	2.006	$76\frac{1}{2}$	4.165	$89\frac{1}{2}$	114.59
$11\frac{3}{4}$	.2080	$24\frac{3}{4}$	.4610	$37\frac{3}{4}$	.7743	$50\frac{3}{4}$	1.224	$63\frac{3}{4}$	2.028	$76\frac{3}{4}$	4.247	$89\frac{3}{4}$	229.17
12°	.2126	25°	.4663	38°	.7813	51°	1.235	64°	2.050	77°	4.332	90°	
$12\frac{1}{4}$	.2171	$25\frac{1}{4}$	.4716	$38\frac{1}{4}$	.7883	$51\frac{1}{4}$	1.246	$64\frac{1}{4}$	2.073	$77\frac{1}{4}$	4.419		
$12\frac{1}{2}$	.2217	$25\frac{1}{2}$	.4770	$38\frac{1}{2}$	.7954	$51\frac{1}{2}$	1.257	$64\frac{1}{2}$	2.097	$77\frac{1}{2}$	4.511		
$12\frac{3}{4}$	.2263	$25\frac{3}{4}$	.4823	$38\frac{3}{4}$	.8026	$51\frac{3}{4}$	1.269	$64\frac{3}{4}$	2.120	$77\frac{3}{4}$	4.606		