PENCOYD IRON WORKS.

A. & P. ROBERTS COMPANY.

1897.

The pages of this book are from advanced sheets of the Tenth Edition of "Steel in Construction," which will be issued early in 1898. They have been prepared especially for those whose work requires the use of the tables contained in the larger book, and being bound separately we trust will be found even more convenient than heretofore. All sections have been corrected up to date, and tables correspond with any changes made.

A. & P. ROBERTS COMPANY.

Pencoyd, Pa., July 15th, 1897.

PENCOYD IRON WORKS.

A. & P. ROBERTS COMPANY.

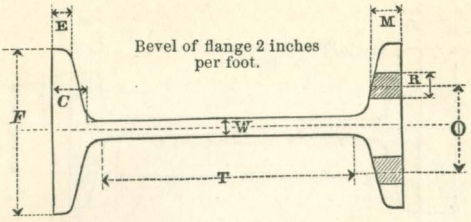
OFFICES:

261 S. FOURTH ST., PHILADELPHIA, PA.

100 BROADWAY, NEW YORK CITY.

1897.

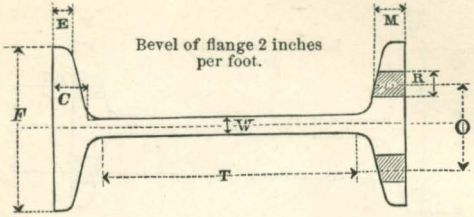
PENCOYD BEAMS.



Dimensions in inches.

Section Number.	*Size of Beam.*	*Weight Pounds per Foot.*	*Area of Section.*	*W.*	*F.*	*C.*	*E.*	*O.*	*R.*	*M.*	*T.*
240B	24	80.0	23.53	.50	7.00	1.14	.60	4.50		.81	20.70
241B	24	85.0	25.00	.56	7.06	1.14	.60	4.50		.81	20.70
242B	24	90.0	26.47	.62	7.12	1.14	.60	4.50		.82	20.70
200B	20	65.0	19.12	.50	6.25	1.03	.55	4.00		.74	16.92
201B	20	70.0	20.59	.56	6.31	1.03	.55	4.00		.74	16.92
202B	20	75.0	22.06	.64	6.39	1.03	.55	4.00		.75	16.92
203B	20	80.0	23.53	.63	6.75	1.12	.61	4.25		.82	16.52
204B	20	85.0	25.00	.70	6.82	1.12	.61	4.25		.82	16.52
205B	20	90.0	26.47	.78	6.90	1.12	.61	4.25		.83	16.52
206B	20	95.0	27.94	.74	7.24	1.25	.68	4.50		.92	15.86
207B	20	100.0	29.41	.81	7.31	1.25	.68	4.50		.93	15.86
180B	18	55.0	16.18	.46	6.00	.92	.46	3.75	3/4	.65	15.19
181B	18	60.0	17.65	.54	6.08	.92	.46	3.75		.65	15.19
182B	18	65.0	19.12	.63	6.17	.92	.46	3.75	to	.66	15.19
183B	18	70.0	20.59	.62	6.50	1.01	.52	4.00		.73	14.76
184B	18	75.0	22.06	.71	6.58	1.01	.52	4.00	7/8	.74	14.76
185B	18	80.0	23.53	.79	6.66	1.01	.52	4.00		.74	14.76
186B	18	85.0	25.00	.74	7.00	1.16	.61	4.50		.83	14.04
187B	18	90.0	26.47	.82	7.08	1.16	.61	4.50		.84	14.04
150B	15	42.0	12.35	.41	5.50	.83	.41	3.25		.60	12.47
151B	15	45.0	13.23	.45	5.54	.83	.41	3.25		.60	12.47
152B	15	50.0	14.70	.48	5.82	.90	.46	3.50		.65	12.21
153B	15	55.0	16.18	.58	5.92	.90	.46	3.50		.66	12.21
154B	15	60.0	17.65	.55	6.17	1.04	.57	3.75		.77	11.82
155B	15	65.0	19.12	.65	6.27	1.04	.57	3.75		.78	11.82
156B	15	70.0	20.58	.63	6.43	1.17	.69	4.00		.89	11.41
157B	15	75.0	22.06	.73	6.53	1.17	.69	4.00		.90	11.41
158B	15	80.0	23.53	.83	6.63	1.17	.69	4.00		.91	11.41

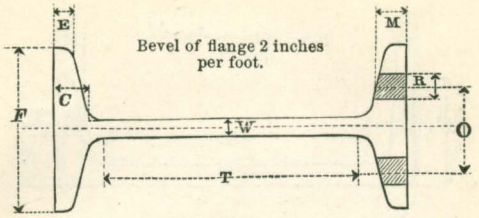
PENCOYD BEAMS.



Dimensions in inches.

Section Number.	*Size of Beam.*	*Weight Pounds per Foot.*	*Area of Section.*	*W.*	*F.*	*C.*	*E.*	*O.*	*R.*	*M.*	*T.*
120B	12	31.5	9.26	.35	5.00	.74	.35	3.00	3/4 to 7/8	.52	9.76
121B	12	35.0	10.29	.42	5.07	.74	.35	3.00	3/4 to 7/8	.52	9.76
122B	12	40.0	11.76	.42	5.25	.88	.48	3.25	3/4 to 7/8	.65	9.35
123B	12	45.0	13.23	.54	5.37	.88	.48	3.25	3/4 to 7/8	.66	9.35
124B	12	50.0	14.70	.55	5.68	.98	.56	3.50	3/4 to 7/8	.74	9.04
125B	12	55.0	16.18	.56	5.75	1.10	.67	3.50	3/4 to 7/8	.86	8.68
126B	12	60.0	17.65	.68	5.87	1.10	.67	3.50	3/4 to 7/8	.87	8.68
127B	12	65.0	19.12	.80	5.99	1.10	.67	3.50	3/4 to 7/8	.88	8.68
100B	10	25.0	7.35	.31	4.66	.67	.31	2.75	3/4	.47	7.96
101B	10	30.0	8.82	.44	4.79	.67	.31	2.75	3/4	.48	7.96
102B	10	35.0	10.29	.44	5.00	.81	.43	3.00	3/4	.60	7.47
103B	10	40.0	11.76	.59	5.15	.81	.43	3.00	3/4	.61	7.47
90B	9	21.0	6.18	.29	4.33	.63	.29	2.50	3/4	.44	7.09
91B	9	25.0	7.35	.39	4.43	.63	.29	2.50	3/4	.45	7.09
92B	9	30.0	8.82	.56	4.60	.63	.29	2.75	3/4	.45	7.09
93B	9	35.0	10.29	.72	4.76	.63	.29	2.75	3/4	.46	7.09
80B	8	18.0	5.29	.27	4.00	.58	.27	2.25	3/4	.42	6.21
81B	8	20.5	6.03	.34	4.07	.58	.27	2.25	3/4	.42	6.21
82B	8	23.0	6.76	.44	4.17	.58	.27	2.50	3/4	.41	6.21
83B	8	25.5	7.50	.53	4.26	.58	.27	2.50	3/4	.42	6.21

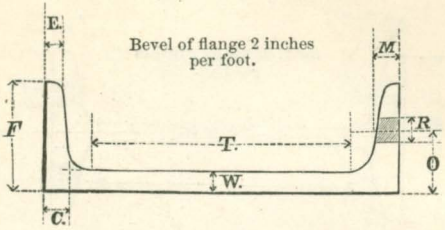
PENCOYD BEAMS.



Dimensions in inches.

Section Number.	*Size of Beam.*	*Weight Pounds per Foot.*	*Area of Section.*	*W.*	*F.*	*C.*	*E.*	*O.*	*R.*	*M.*	*T.*
70B	7	15.0	4.41	.25	3.66	.53	.25	2.00	3/4	.39	5.34
71B	7	17.5	5.15	.34	3.75	.53	.25	2.00	3/4	.39	5.34
72B	7	20.0	5.88	.45	3.86	.53	.25	2.25	3/4	.38	5.34
60B	6	12.25	3.60	.23	3.33	.49	.23	1.75	5/8	.36	4.46
61B	6	14.75	4.34	.34	3.44	.49	.23	1.75	5/8	.37	4.46
62B	6	17.25	5.07	.46	3.56	.49	.23	2.00	5/8	.36	4.46
50B	5	9.75	2.87	.21	3.00	.44	.21	1.75	5/8	.31	3.59
51B	5	12.25	3.60	.34	3.13	.44	.21	1.75	5/8	.32	3.59
52B	5	14.75	4.34	.49	3.28	.44	.21	2.00	5/8	.32	3.59
40B	4	7.50	2.20	.19	2.66	.40	.19	1.50	1/2	.29	2.72
41B	4	8.50	2.50	.24	2.71	.40	.19	1.50	1/2	.29	2.72
42B	4	9.50	2.79	.32	2.79	.40	.19	1.75	1/2	.28	2.72
43B	4	10.50	3.09	.39	2.86	.40	.19	1.75	1/2	.28	2.72
30B	3	5.50	1.62	.17	2.33	.35	.17	1.25	1/2	.26	1.85
31B	3	6.50	1.91	.24	2.40	.35	.17	1.25	1/2	.27	1.85
32B	3	7.50	2.20	.34	2.50	.35	.17	1.50	1/2	.25	1.85
63B	6	32.3 to 37.4	9.49 to 10.99	.50	4.88	.87	.50	3.00	5/8 to 3/4	.66	3.00
67B	6	41.0 to 46.1	12.06 to 13.56	.63	5.25	1.06	.62	3.25	3/4 to 7/8	.81	2.60

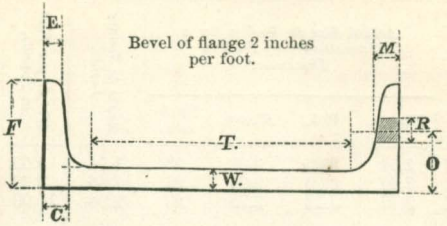
PENCOYD CHANNELS.



Dimensions in inches.

Section Number.	*Size of Channel.*	*Weight Pounds per Foot.*	*Area of Section.*	*W.*	*F.*	*C.*	*E.*	*O.*	*R.*	*M.*	*T.*
150C	15	33.0	9.70	.40	3.40	.90	.40	2.00	3/4 to 7/8	.63	12.35
151C	15	35.0	10.29	.42	3.42	.90	.40	2.00	3/4 to 7/8	.64	12.35
152C	15	40.0	11.76	.52	3.52	.90	.40	2.13	3/4 to 7/8	.63	12.35
153C	15	45.0	13.23	.62	3.62	.90	.40	2.25	3/4 to 7/8	.63	12.35
154C	15	50.0	14.70	.63	4.00	1.05	.49	2.50	3/4 to 7/8	.74	11.89
155C	15	55.0	16.18	.72	4.09	1.05	.49	2.63	3/4 to 7/8	.73	11.89
120C	12	20.5	6.03	.28	2.94	.72	.28	1.75	3/4	.48	9.91
121C	12	25.0	7.35	.39	3.05	.72	.28	1.88	3/4	.47	9.91
122C	12	30.0	8.82	.51	3.17	.72	.28	2.00	3/4	.47	9.91
123C	12	35.0	10.29	.50	3.50	.95	.45	2.00	3/4 to 7/8	.70	9.17
124C	12	40.0	11.76	.62	3.62	.95	.45	2.13	3/4 to 7/8	.70	9.17
100C	10	15.0	4.41	.24	2.60	.63	.24	1.50	3/4	.42	8.16
101C	10	20.0	5.88	.38	2.74	.63	.24	1.63	3/4	.42	8.16
102C	10	25.0	7.35	.45	2.91	.76	.36	1.75	3/4 to 7/8	.55	7.68
103C	10	30.0	8.82	.60	3.06	.76	.36	1.88	3/4 to 7/8	.55	7.68
104C	10	35.0	10.29	.75	3.21	.76	.36	2.00	3/4 to 7/8	.56	7.68
90C	9	13.25	3.90	.23	2.43	.60	.23	1.38	3/4	.41	7.25
91C	9	15.00	4.41	.28	2.48	.60	.23	1.38	3/4	.42	7.25
92C	9	20.00	5.88	.38	2.72	.71	.32	1.50	3/4	.52	6.87
93C	9	25.00	7.35	.54	2.88	.71	.32	1.63	3/4	.53	6.87
128C	12	20.5 to 32.0	6.03 to 9.41	.28 to .56	2.61 to 2.89	.73	.34	1.50	3/4	.53	9.49
	12					.73	.34	1.75	3/4	.53	9.49

PENCOYD CHANNELS.



Dimensions in inches.

Section Number.	Size of Channel.	Weight Pounds per Foot.	Area of Section.	W.	F.	C.	E.	O.	R.	M.	T.
80C	8	11.25	3.31	.22	2.26	.56	.22	1.25	3/4	.38	6.34
81C	8	13.75	4.04	.30	2.34	.56	.22	1.38	3/4	.38	6.34
82C	8	16.25	4.78	.33	2.55	.65	.28	1.50	3/4	.46	6.06
83C	8	18.75	5.51	.42	2.64	.65	.28	1.50	3/4	.47	6.06
84C	8	21.25	6.25	.52	2.74	.65	.28	1.56	3/4	.48	6.06
70C	7	9.75	2.87	.21	2.09	.52	.21	1.13	5/8	.37	5.43
71C	7	12.25	3.60	.31	2.19	.52	.21	1.25	5/8	.37	5.43
72C	7	14.75	4.34	.36	2.46	.60	.25	1.50	5/8 to 3/4	.41	5.21
73C	7	17.25	5.07	.46	2.56	.60	.25	1.50	5/8 to 3/4	.43	5.21
74C	7	19.75	5.81	.57	2.67	.60	.25	1.63	5/8 to 3/4	.42	5.21
60C	6	8.00	2.35	.20	1.92	.49	.20	1.06	1/2	.35	4.52
61C	6	10.50	3.09	.27	2.14	.53	.22	1.25	1/2 to 5/8	.37	4.39
62C	6	13.00	3.82	.40	2.27	.53	.22	1.38	1/2 to 5/8	.37	4.39
63C	6	15.50	4.56	.52	2.39	.53	.22	1.50	1/2 to 5/8	.37	4.39
50C	5	6.50	1.91	.19	1.75	.45	.19	1.06	1/2	.31	3.61
51C	5	9.00	2.65	.32	1.88	.45	.19	1.19	1/2	.31	3.61
52C	5	11.50	3.38	.47	2.03	.45	.19	1.31	1/2	.31	3.61
40C	4	5.25	1.54	.18	1.58	.41	.18	0.94	3/8	.29	2.70
41C	4	6.25	1.84	.24	1.64	.41	.18	1.00	3/8	.29	2.70
42C	4	7.25	2.13	.32	1.72	.41	.18	1.06	3/8	.29	2.70
30C	3	4.00	1.18	.17	1.41	.38	.17	0.81	3/8	.27	1.79
31C	3	5.00	1.47	.25	1.49	.38	.17	0.88	3/8	.27	1.79
32C	3	6.00	1.76	.35	1.59	.38	.17	1.00	3/8	.27	1.79

PENCOYD Z BARS.

Nominal Size in Inches.	Section Number.	Actual Size in Inches for a Variation of $\frac{1}{16}$ Inch in Thickness.				Areas in Square Inches.	Weight per Foot in Pounds.	Increased Thickness in Inches for each Additional Pound per Foot.
		Flange.	Web.	Flange.	Thickness.			
3	30Z	2.62	3.00	2.62	.25	1.94	6.60	
3	31Z	2.69	3.06	2.69	.31	2.44	8.29	.037
3	32Z	2.75	3.12	2.75	.37	2.94	10.00	
3	33Z	2.66	3.00	2.66	.44	3.25	11.15	
3	34Z	2.69	3.03	2.69	.47	3.51	11.93	.039
3	35Z	2.72	3.06	2.72	.50	3.75	12.75	
4	40Z	2.87	4.00	2.87	.25	2.32	7.88	
4	41Z	2.94	4.06	2.94	.31	2.91	9.89	.031
4	42Z	3.00	4.12	3.00	.37	3.52	11.90	
4	43Z	2.97	4.00	2.97	.44	3.96	13.46	
4	44Z	3.03	4.06	3.03	.50	4.56	15.50	.031
4	45Z	3.09	4.12	3.09	.56	5.16	17.54	
4	46Z	3.06	4.00	3.06	.62	5.55	18.80	
4	47Z	3.12	4.06	3.12	.68	6.14	20.87	.030
4	48Z	3.19	4.12	3.19	.75	6.75	22.95	
5	50Z	3.19	5.00	3.19	.31	3.36	11.42	
5	51Z	3.25	5.06	3.25	.37	4.05	13.77	.026
5	52Z	3.31	5.12	3.31	.44	4.75	16.15	
5	53Z	3.22	5.00	3.22	.50	5.23	17.78	
5	54Z	3.28	5.06	3.28	.56	5.91	20.09	.027
5	55Z	3.34	5.12	3.34	.62	6.60	22.44	
5	56Z	3.25	5.00	3.25	.68	6.96	23.66	.027
5	57Z	3.31	5.06	3.31	.75	7.64	25.97	
6	60Z	3.50	6.00	3.50	.37	4.59	15.61	
6	61Z	3.56	6.06	3.56	.44	5.39	18.32	.023
6	62Z	3.62	6.12	3.62	.50	6.19	21.05	
6	63Z	3.50	6.00	3.50	.56	6.68	22.71	
6	64Z	3.56	6.06	3.56	.62	7.46	25.36	.023
6	65Z	3.62	6.12	3.62	.69	8.25	28.05	
6	66Z	3.50	6.00	3.50	.75	8.64	29.37	
6	67Z	3.56	6.06	3.56	.81	9.38	31.89	.025
6	68Z	3.62	6.12	3.62	.87	10.16	34.54	

(For Rivet Spacing, see page 32.)

PENCOYD DECK BEAMS.

Depth in Inches.	Section Numbers.	Minimum Flange Width in Inches.	Minimum Web Thickness in Inches.	Minimum Weight per Foot in Pounds.	Approximate Weight in Pounds per Foot for each Thickness of Web, in Inches.								Increased Thickness in Inches for each Additional Pound per Foot.
					5/16	3/8	7/16	1/2	9/16	5/8	11/16	3/4	
11½	115D	5.25	.406	32.2			33.4	35.8	38.2	40.7	43.1	45.6	.026
10	100D	5.25	.375	28.0		28.0	30.2	32.3	34.4	36.5	38.6		.029
9	90D	5.00	.375	25.0		25.0	26.9	28.8	30.7	32.6			.033
8	80D	4.62	.343	21.0		21.8	23.5	25.2	26.9	28.6			.037
7	70D	4.25	.343	18.0		18.5	20.0	21.5	23.0	24.5			.042
6	60D	3.75	.312	14.5	14.5	15.8	17.1	18.3	19.6				.049
5	50D	3.25	.312	11.5	11.5	12.5	13.6	14.7	15.8				.059

PENCOYD BULB ANGLES.

10	100A	3.62	.500	25.6				25.6	28.6	31.5			.022
9	90A	3.50	.484	22.5				23.2	26.0				.023
8	80A	3.37	.453	19.5				21.3	23.7				.026
7	70A	3.19	.406	16.0			17.1	19.2					.030
6	60A	3.00	.359	12.7		13.2	15.1	17.1	19.0				.033
5	50A	2.75	.312	9.7	9.7	11.4	13.0						.038

PENCOYD ANGLES.

EVEN LEGS.

Dimensions in inches. Weight in pounds.

Section Number.	Size.	Thickness.	Weight per Foot.	Area of Section.	Section Number.	Size.	Thickness.	Weight per Foot.	Area of Section.
880A	8 x 8	1/2	26.4	7.76	553A	5 x 5	9/16	18.2	5.35
881A	8 x 8	9/16	29.8	8.76	554A	5 x 5	5/8	20.1	5.91
882A	8 x 8	5/8	33.2	9.76	555A	5 x 5	11/16	22.0	6.47
883A	8 x 8	11/16	36.6	10.76	556A	5 x 5	3/4	23.8	7.00
884A	8 x 8	3/4	39.0	11.47	557A	5 x 5	13/16	25.6	7.53
885A	8 x 8	13/16	42.4	12.47	558A	5 x 5	7/8	27.4	8.06
886A	8 x 8	7/8	45.8	13.47	559A	5 x 5	15/16	29.4	8.65
887A	8 x 8	15/16	49.3	14.50					
888A	8 x 8	1	52.8	15.53					
					440A	4 x 4	5/16	8.2	2.41
660A	6 x 6	3/8	14.8	4.35	441A	4 x 4	3/8	9.8	2.88
661A	6 x 6	7/16	17.3	5.09	442A	4 x 4	7/16	11.3	3.32
662A	6 x 6	1/2	19.7	5.79	443A	4 x 4	1/2	12.8	3.76
663A	6 x 6	9/16	22.0	6.47	444A	4 x 4	9/16	14.5	4.21
664A	6 x 6	5/8	24.4	7.18	445A	4 x 4	5/8	15.8	4.65
665A	6 x 6	11/16	26.5	7.79	446A	4 x 4	11/16	17.2	5.06
666A	6 x 6	3/4	28.8	8.47	447A	4 x 4	3/4	18.6	5.47
667A	6 x 6	13/16	31.0	9.12					
668A	6 x 6	7/8	33.4	9.82					
669A	6 x 6	15/16	35.9	10.56	350A	3 1/2 x 3 1/2	5/16	7.1	2.09
					351A	3 1/2 x 3 1/2	3/8	8.5	2.50
					352A	3 1/2 x 3 1/2	7/16	9.8	2.88
550A	5 x 5	3/8	12.3	3.62	353A	3 1/2 x 3 1/2	1/2	11.1	3.26
551A	5 x 5	7/16	14.3	4.21	354A	3 1/2 x 3 1/2	9/16	12.4	3.65
552A	5 x 5	1/2	16.3	4.79	355A	3 1/2 x 3 1/2	5/8	13.7	4.03

PENCOYD ANGLES.

EVEN LEGS.

Dimensions in inches. Weight in pounds.

Section Number.	Size.	Thickness.	Weight per Foot.	Area of Section.
330A	3 x 3	1/4	4.9	1.44
331A	3 x 3	5/16	6.1	1.79
332A	3 x 3	3/8	7.2	2.12
333A	3 x 3	7/16	8.3	2.44
334A	3 x 3	1/2	9.4	2.76
335A	3 x 3	9/16	10.4	3.06
336A	3 x 3	5/8	11.5	3.38
275A	2 3/4 x 2 3/4	1/4	4.5	1.32
276A	2 3/4 x 2 3/4	5/16	5.5	1.62
277A	2 3/4 x 2 3/4	3/8	6.6	1.94
278A	2 3/4 x 2 3/4	7/16	7.7	2.26
279A	2 3/4 x 2 3/4	1/2	8.6	2.53
250A	2 1/2 x 2 1/2	3/16	3.1	0.91
251A	2 1/2 x 2 1/2	1/4	4.1	1.21
252A	2 1/2 x 2 1/2	5/16	5.0	1.47
253A	2 1/2 x 2 1/2	3/8	5.9	1.74
254A	2 1/2 x 2 1/2	7/16	6.9	2.03
255A	2 1/2 x 2 1/2	1/2	7.8	2.29
225A	2 1/4 x 2 1/4	3/16	2.7	0.79
226A	2 1/4 x 2 1/4	1/4	3.6	1.06
227A	2 1/4 x 2 1/4	5/16	4.5	1.32
228A	2 1/4 x 2 1/4	3/8	5.4	1.59
220A	2 x 2	3/16	2.5	0.74
221A	2 x 2	1/4	3.2	0.94
222A	2 x 2	5/16	4.0	1.18
223A	2 x 2	3/8	4.8	1.41
175A	1 3/4 x 1 3/4	3/16	2.1	0.62
176A	1 3/4 x 1 3/4	1/4	2.8	0.82
177A	1 3/4 x 1 3/4	5/16	3.5	1.03
178A	1 3/4 x 1 3/4	3/8	4.1	1.21
150A	1 1/2 x 1 1/2	1/8	1.2	0.35
151A	1 1/2 x 1 1/2	3/16	1.8	0.53
152A	1 1/2 x 1 1/2	1/4	2.4	0.71
153A	1 1/2 x 1 1/2	5/16	2.9	0.85
154A	1 1/2 x 1 1/2	3/8	3.5	1.03
125A	1 1/4 x 1 1/4	1/8	1.0	0.29
126A	1 1/4 x 1 1/4	3/16	1.5	0.44
127A	1 1/4 x 1 1/4	1/4	2.0	0.59
110A	1 x 1	1/8	0.8	0.24
111A	1 x 1	3/16	1.2	0.35
112A	1 x 1	1/4	1.5	0.44

PENCOYD ANGLES.

UNEVEN LEGS.

Dimensions in inches. Weight in pounds.

Section Number.	Size.	Thickness.	Weight per Foot.	Area of Section.
860A	8 x 6	1/2	23.0	6.76
861A	8 x 6	9/16	25 8	7.59
862A	8 x 6	5/8	28.7	8.44
863A	8 x 6	11/16	31.7	9.32
864A	8 x 6	3/4	33.8	9.94
865A	8 x 6	13/16	36.6	10.76
866A	8 x 6	7/8	39.5	11.62
867A	8 x 6	15/16	42.5	12.50
868A	8 x 6	1	45.6	13.41
730A	7 x 3 1/2	1/2	17.0	5.00
731A	7 x 3 1/2	9/16	19.0	5.59
732A	7 x 3 1/2	5/8	21.0	6.18
733A	7 x 3 1/2	11/16	23.0	6.76
734A	7 x 3 1/2	3/4	24.8	7.29
735A	7 x 3 1/2	13/16	26.7	7.85
736A	7 x 3 1/2	7/8	28.6	8.41
737A	7 x 3 1/2	15/16	30.5	8.97
738A	7 x 3 1/2	1	32.5	9.56
650A	6 1/2 x 4	3/8	12.9	3.79
651A	6 1/2 x 4	7/16	15.0	4.41
652A	6 1/2 x 4	1/2	17.0	5.00
653A	6 1/2 x 4	9/16	19.0	5.59
654A	6 1/2 x 4	5/8	21.2	6.24
655A	6 1/2 x 4	11/16	23.4	6.88
656A	6 1/2 x 4	3/4	25.6	7.53
657A	6 1/2 x 4	13/16	27.8	8.18
658A	6 1/2 x 4	7/8	29.8	8.77
659A	6 1/2 x 4	15/16	31.9	9.38
640A	6 x 4	3/8	12.2	3.59
641A	6 x 4	7/16	14.3	4.21
642A	6 x 4	1/2	16.3	4.79
643A	6 x 4	9/16	18.1	5.32
644A	6 x 4	5/8	20.1	5.91
645A	6 x 4	11/16	22.0	6.47
646A	6 x 4	3/4	23.8	7.00
647A	6 x 4	13/16	25.6	7.53
648A	6 x 4	7/8	27.4	8.06
649A	6 x 4	15/16	29.4	8.65
630A	6 x 3 1/2	3/8	11.6	3.41
631A	6 x 3 1/2	7/16	13.6	4.00
632A	6 x 3 1/2	1/2	15.5	4.56
633A	6 x 3 1/2	9/16	17.1	5.03
634A	6 x 3 1/2	5/8	19.0	5.59
635A	6 x 3 1/2	11/16	20.8	6.12
636A	6 x 3 1/2	3/4	22.6	6.65
637A	6 x 3 1/2	13/16	24.5	7.21
638A	6 x 3 1/2	7/8	26.5	7.79
639A	6 x 3 1/2	15/16	28.6	8.41
500A	5 1/2 x 3 1/2	3/8	11.0	3.24
501A	5 1/2 x 3 1/2	7/16	12.8	3.76
502A	5 1/2 x 3 1/2	1/2	14.6	4.29
503A	5 1/2 x 3 1/2	9/16	16.2	4.76
504A	5 1/2 x 3 1/2	5/8	17.9	5.26
540A	5 x 4	3/8	11.0	3.24
541A	5 x 4	7/16	12.8	3.76
542A	5 x 4	1/2	14.6	4.29
543A	5 x 4	9/16	16.2	4.76
544A	5 x 4	5/8	17.9	5.26
545A	5 x 4	11/16	19.6	5.76
546A	5 x 4	3/4	21.3	6.26
510A	5 x 3 1/2	5/16	8.7	2.56
511A	5 x 3 1/2	3/8	10.3	3.03
512A	5 x 3 1/2	7/16	12.0	3.53
513A	5 x 3 1/2	1/2	13.6	4.00
514A	5 x 3 1/2	9/16	15.2	4.47
515A	5 x 3 1/2	5/8	16.8	4.94
516A	5 x 3 1/2	11/16	18.4	5.41
517A	5 x 3 1/2	3/4	20.0	5.88

PENCOYD ANGLES.

UNEVEN LEGS.

Dimensions in inches. Weight in pounds.

Section Number.	Size.	Thickness.	Weight per Foot.	Area of Section.
530A	5 x 3	5/16	8.2	2.41
531A	5 x 3	3/8	9.7	2.85
532A	5 x 3	7/16	11.2	3.29
533A	5 x 3	1/2	12.8	3.76
534A	5 x 3	9/16	14.2	4.18
535A	5 x 3	5/8	15.7	4.62
536A	5 x 3	11/16	17.2	5.06
537A	5 x 3	3/4	18.7	5.50
450A	4 1/2 x 3	5/16	7.7	2.26
451A	4 1/2 x 3	3/8	9.1	2.68
452A	4 1/2 x 3	7/16	10.5	3.09
453A	4 1/2 x 3	1/2	11.9	3.50
454A	4 1/2 x 3	9/16	13.3	3.91
455A	4 1/2 x 3	5/8	14.7	4.32
456A	4 1/2 x 3	11/16	16.0	4.71
457A	4 1/2 x 3	3/4	17.4	5.12
410A	4 x 3 1/2	5/16	7.7	2.26
411A	4 x 3 1/2	3/8	9.1	2.68
412A	4 x 3 1/2	7/16	10.5	3.09
413A	4 x 3 1/2	1/2	11.9	3.50
414A	4 x 3 1/2	9/16	13.3	3.91
415A	4 x 3 1/2	5/8	14.7	4.32
416A	4 x 3 1/2	11/16	16.0	4.71
417A	4 x 3 1/2	3/4	17.4	5.12
430A	4 x 3	5/16	7.1	2.09
431A	4 x 3	3/8	8.5	2.50
432A	4 x 8	7/16	9.8	2.88
433A	4 x 3	1/2	11.1	3.26
434A	4 x 3	9/16	12.4	3.65
435A	4 x 3	5/8	13.8	4.06
300A	3 1/2 x 3	5/16	6.6	1.94
301A	3 1/2 x 3	3/8	7.8	2.29
302A	3 1/2 x 3	7/16	9.1	2.68
303A	3 1/2 x 3	1/2	10.3	3.03
304A	3 1/2 x 3	9/16	11.6	3.41
305A	3 1/2 x 3	5/8	12.9	3.79

Section Number.	Size.	Thickness.	Weight per Foot.	Area of Section.
310A	3 1/2 x 2 1/2	1/4	4.9	1.44
311A	3 1/2 x 2 1/2	5/16	6.1	1.79
312A	3 1/2 x 2 1/2	3/8	7.2	2.12
313A	3 1/2 x 2 1/2	7/16	8.3	2.44
314A	3 1/2 x 2 1/2	1/2	9.4	2.76
316A	3 1/2 x 2	1/4	4.5	1.32
317A	3 1/2 x 2	5/16	5.5	1.62
318A	3 1/2 x 2	3/8	6.6	1.94
325A	3 x 2 1/2	1/4	4.5	1.32
326A	3 x 2 1/2	5/16	5.5	1.62
327A	3 x 2 1/2	3/8	6.6	1.94
328A	3 x 2 1/2	7/16	7.7	2.26
329A	3 x 2 1/2	1/2	8.7	2.56
320A	3 x 2	1/4	4.1	1.21
321A	3 x 2	5/16	5.0	1.47
322A	3 x 2	3/8	5.9	1.74
323A	3 x 2	7/16	6.9	2.03
324A	3 x 2	1/2	7.9	2.32
200A	2 1/2 x 2	3/16	2.7	0.79
201A	2 1/2 x 2	1/4	3.6	1.06
202A	2 1/2 x 2	5/16	4.5	1.32
203A	2 1/2 x 2	3/8	5.4	1.59
204A	2 1/2 x 2	7/16	6.2	1.82
205A	2 1/2 x 2	1/2	7.0	2.06
206A	2 1/4 x 1 1/2	3/16	2.3	0.68
207A	2 1/4 x 1 1/2	1/4	3.0	0.88
208A	2 1/4 x 1 1/2	5/16	3.7	1.09
209A	2 1/4 x 1 1/2	3/8	4.4	1.29
215A	2 x 1 1/2	3/16	2.1	0.62
216A	2 x 1 1/2	1/4	2.9	0.85
217A	2 x 1 1/2	5/16	3.6	1.06
218A	2 x 1 1/2	3/8	4.3	1.26
210A	2 x 1 1/4	3/16	1.9	0.56
211A	2 x 1 1/4	1/4	2.6	0.76
212A	2 x 1 1/4	5/16	3.3	0.97
213A	2 x 1 1/4	3/8	3.9	1.15

PENCOYD ANGLES.

SQUARE ROOT ANGLES.

No. of Section.	Size in Inches.	Approximate Weight in Pounds per Foot for Various Thicknesses in Inches.											
		1/8	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16	3/4	7/8
		.125	.1875	.25	.3125	.375	.4375	.50	.5625	.625	.6875	.75	.875
40A	4 x 4					9.8	11.4	13.0	14.6	16.2			
35A	3½ x 3½				7.1	8.5	9.9	11.4					
30A	3 x 3			4.9	6.1	7.2	8.3	9.4					
28A	2¾ x 2¾			4.5	5.6	6.7	7.8	8.9					
25A	2½ x 2½			4.1	5.1	6.1	7.1	8.2					
24A	2¼ x 2¼			3.6	4.5	5.4							
20A	2 x 2			3.3	4.1	4.9							
18A	1¾ x 1¾			2.9	3.6	4.4							
15A	1½ x 1½		1.80	2.4	3.0								
12A	1¼ x 1¼		1.53	2.04	2.55								
10A	1 x 1	0.82	1.16	1.53									

ANGLE COVERS.

No. of Section.	Size in Inches.	Approximate Weight in Pounds per Foot for Various Thicknesses in Inches.											
		1/8	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16	3/4	7/8
		.125	.1875	.25	.3125	.375	.4375	.50	.5625	.625	.6875	.75	.875
33A	3 x 3			4.8	5.9	7.1	8.2	9.3	10.4	11.5			
27A	2¾ x 2¾			4.4	5.5	6.6	7.7	8.8					
26A	2½ x 2½		3.0	4.0	5.0	6.0	7.0	8.1					
23A	2¼ x 2¼		2.6	3.5	4.4	5.3							
22A	2 x 2		2.4	3.2	4.0	4.8							

SPECIAL ANGLES.

No. of Section.	Size in Inches.	Approximate Weight in Pounds per Foot for Various Thicknesses in Inches.											
		1/8	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16	3/4	7/8
		.125	.1875	.25	.3125	.375	.4375	.50	.5625	.625	.6875	.75	.875
278A	2⅜ x 2¼			4.2	5.3	6.4							
415A	4½ x 1½		3.6	4.9									

PENCOYD TEES.

For details see lithographs—Plates Nos. 23, 24, 25 and 26.

EVEN TEES.			UNEVEN TEES.		
Section Number.	*Size in Inches.*	*Weight per Foot.*	*Section Number.*	*Size in Inches.*	*Weight per Foot.*
440T	4 x 4	10.9	64T	6 x 4	17.4
441T	4 x 4	13.7	65T	6 x 5¼	39.0
335T	3½ x 3½	7.0	53T	5 x 3½	17.0
336T	3½ x 3½	9.0	54T	5 x 4	15.3
337T	3½ x 3½	11.0	42T	4 x 2	6.5
330T	3 x 3	6.5	43T	4 x 3	9.0
331T	3 x 3	7.7	44T	4 x 3	10.2
225T	2½ x 2½	5.0	45T	4 x 4½	13.5
226T	2½ x 2½	5.8	38T	3½ x 3	7.0
227T	2½ x 2½	6.6	39T	3½ x 3	8.5
222T	2¼ x 2¼	4.0	30T	3 x 1½	4.0
223T	2¼ x 2¼	4.0	31T	3 x 2½	5.0
220T	2 x 2	3.5	32T	3 x 2½	6.0
117T	1¾ x 1¾	2.4	33T	3 x 2½	7.0
115T	1½ x 1½	2.0	34T	3 x 2½	8.0
112T	1¼ x 1¼	1.5	35T	3 x 3½	8.3
110T	1 x 1	1.0	36T	3 x 3½	9.5
			28T	2¾ x 1¾	6.6
			29T	2¾ x 2	7.2
			25T	2½ x 1¼	3.3
			26T	2½ x 2¾	5.7
			27T	2½ x 3	6.0
			24T	2¼ x 9/16	2.2
			20T	2 x 9/16	2.0
			22T	2 x 1 1/16	2.0
			21T	2 x 1	2.5
			23T	2 x 1½	3.0
			17T	1¾ x 1 1/16	1.9
			18T	1¾ x 1¼	3.5
			15T	1½ x 15/16	1.4
			12T	1¼ x 15/16	1.2

MISCELLANEOUS SHAPES.

Section Number.	*Section.*	*Size in Inches.*	*Weight per Foot in Pounds.*
217M	Heavy Rail.	6	50.0
210M	Floor Bars.	3 1/16 x 4 x 3 1/16 x ¼ to ½	7.1 to 14.3
260M		2½ x 6 x 2½ x ¼ to 3/8	9.8 to 14.7

SIZES OF PENCOYD BARS.

FLATS.

7/8	x 3/8	inches to	3/4	inches.
1	x 1/4	"	7/8	"
1 1/32	x 1/2	"	1	"
1 1/16	x 1/2	"	1	"
1 1/8	x 1/4	"	1	"
1 3/16	x 5/8	"	1	"
1 7/32	x 1/2	"	1	"
1 1/4	x 1/4	"	1	"
1 5/16	x 5/8	"	1	"
1 3/8	x 1/4	"	1 1/4	"
1 13/32	x 5/8	"	1	"
1 7/16	x 11/16	"	1 1/8	"
1 1/2	x 1/4	"	1 1/4	"
1 19/32	x 3/4	"	1 1/4	"
1 5/8	x 1/4	"	1 1/2	"
1 3/4	x 1/4	"	1 1/4	"
1 31/32	x 5/8	"	1 3/4	"
2	x 1/4	"	1 1/2	"

2 5/32	x 1 3/8	inches to	2	inches.
2 1/4	x 1/4	"	1 7/8	"
2 5/16	x 1 1/2	"	2	"
2 3/8	x 5/8	"	1 3/4	"
2 1/2	x 1/4	"	1 3/4	"
2 3/4	x 1/4	"	7/8	"
3	x 1/4	"	2	"
3 1/4	x 1/4	"	7/8	"
3 1/2	x 1/4	"	7/8	"
4	x 1/4	"	2 1/2	"
4 1/2	x 1/4	"	7/8	"
5	x 1/4	"	2 1/2	"
6	x 1/4	"	2 1/2	"
7	x 1/4	"	2 1/2	"
8	x 1/4	"	2 1/2	"
9	x 1/4	"	2 3/4	"
10	x 1/4	"	2 1/2	"
12	x 1/4	"	2 1/2	"

ROUNDS.

1/2, 9/16, 5/8, 11/16, 3/4, 13/16, 7/8, 15/16, 1, 1 1/16, 1 1/8, 1 3/16, 1 1/4, 1 5/16, 1 3/8, 1 7/16, 1 1/2, 1 9/16, 1 5/8, 1 3/4, 1 7/8, 2, 2 1/8, 2 1/4, 2 3/8, 2 1/2, 2 5/8, 2 3/4, 2 7/8, 3, 3 1/8, 3 1/4, 3 3/8, 3 1/2, 3 5/8, 3 3/4, 3 7/8, 4, 4 1/8, 4 1/4, 4 3/8, 4 1/2, 4 5/8, 4 3/4, 4 7/8, 5, 5 1/4, 5 1/2, 5 3/4, 6, 6 1/2, 7 inches.

HALF ROUNDS.

1/2, 9/16, 5/8, 11/16, 3/4, 13/16, 7/8, 15/16, 1, 1 1/8, 1 1/4, 1 3/8, 1 1/2, 1 5/8, 1 3/4, 2, 2 1/4, 2 1/2, 3, 3 1/2, 4, 4 1/2 inches.

SQUARES.

1/2, 9/16, 5/8, 11/16, 3/4, 13/16, 7/8, 15/16, 1, 1 1/16, 1 1/8, 1 3/16, 1 1/4, 1 3/8, 1 1/2, 1 5/8, 1 3/4, 1 7/8, 2, 2 1/8, 2 1/4, 2 3/8, 2 1/2, 2 5/8, 2 3/4, 2 7/8, 3, 3 1/8, 3 1/4, 3 3/8, 3 1/2, 3 5/8, 3 3/4, 3 7/8, 4, 4 1/8, 4 1/4, 4 3/8, 4 1/2, 4 5/8, 4 3/4, 4 7/8, 5 inches.

RIVET SIZES.

30/64, 31/64, 33/64, 37/64, 38/64, 39/64, 41/64, 46/64, 47/64, 49/64, 53/64, 54/64, 55/64, 57/64, 61/64, 62/64, 63/64, 1 1/64, 1 5/64, 1 9/64, 1 13/64, 1 17/64 inches.

BOLT SIZES 1/64TH FULL.

1/2, 9/16, 5/8, 11/16, 3/4, 13/16, 7/8, 15/16, 1, 1 1/16, 1 1/8, 1 3/16, 1 1/4 inches.

TABLES FOR PENCOYD BEAMS.

The following pages give the safe loads, evenly distributed, for all the standard sections of I beams and channel bars, based on an extreme fibre stress of 16,000 pounds per square inch of section, or approximately one-half the elastic limit of the material. In this revised classification, the former system of graduating the section by minute alterations of web thickness is abandoned, and, instead, a limited number of standard sections is substituted, varying from each other by a weight of five pounds per foot for the larger sizes and two and one-half pounds per foot for the smaller sizes, as low as four inch. The dimensions in detail of each of these standard sections will be found on pages 3 to 7. The figures in fine type under the safe loads give the corresponding deflection in inches; for a less load than denoted the deflection will be less in direct proportion.

The figures below the horizontal dark lines on the tables represent spans and loads, causing a deflection exceeding $\frac{1}{360}$th part of the span, or about the permissible limit for plastered ceilings, etc.

These greatest safe loads should be applied only under favorable conditions, and the loads should be reduced for service of the character indicated below.

Character of Service.	*Greatest Safe Load.*
Quiescent or slowly moving load.	As in tables.
Fluctuating or rapidly moving load.	One-fifth ($\frac{1}{5}$) less than tables.
Alternating loads causing impact, or inertia stresses.	One-third ($\frac{1}{3}$) less than tables.

The tables also apply to beams secured to resist lateral flexure. If the beams must be long without lateral support reduce the maximum load as follows:

BEAMS WITHOUT LATERAL SUPPORT.

Length of Beam.	*Proportion of Tabular Load Forming Greatest Safe Load.*
20 times flange width.	Whole tabular load.
30 " " "	$\frac{9}{10}$ " "
40 " " "	$\frac{8}{10}$ " "
50 " " "	$\frac{7}{10}$ " "
60 " " "	$\frac{6}{10}$ " "
70 " " "	$\frac{5}{10}$ " "

PENCOYD I BEAMS.

Greatest safe loads in tons evenly distributed, including beam itself. For concentrated load in middle of beam take one half amount in table.

Size in Inches.	*Section Number.*	*Weight per Foot in Pounds.*	*Length of Span in Feet.*						
			12	13	14	15	16	17	18
			Safe Load in Tons.						
24	240B	80	37.85 .05	37.85 .06	37.85 .08	37.85 .10	37.85 .12	37.85 .14	37.85 .17
24	241B	85	48.52 .06	48.52 .08	48.52 .10	48.52 .12	48.52 .15	48.52 .18	48.52 .21
24	242B	90	59.94 .07	59.94 .09	59.94 .12	59.94 .15	59.94 .18	58.87 .21	55.60 .28
20	200B	65	37.14 .09	37.14 .11	37.14 .14	37.14 .17	37.14 .21	37.01 .25	34.95 .28
20	201B	70	49.09 .11	49.09 .14	46.82 .17	43.70 .19	40.97 .22	38.56 .25	36.42 .28
20	202B	75	56.79 .12	52.42 .14	48.68 .17	45.43 .19	42.59 .22	40.08 .25	37.86 .28
20	203B	80	60.29 .12	57.62 .14	53.50 .17	49.93 .19	46.81 .22	44.06 .25	41.61 .28
20	204B	85	64.58 .12	59.61 .14	55.36 .17	51.67 .19	48.44 .22	45.59 .25	43.06 .28
20	205B	90	66.74 .12	61.61 .14	57.21 .17	53.39 .19	50.06 .22	47.11 .25	44.50 .28
20	206B	95	72.00 .12	66.47 .14	61.72 .17	57.60 .19	54.00 .22	50.83 .25	48.00 .28
20	207B	100	74.15 .12	68.44 .14	63.56 .17	59.32 .19	55.61 .22	52.34 .25	49.43 .28
18	180B	55	32.78 .11	32.78 .14	32.78 .18	31.96 .21	29.97 .24	28.20 .28	26.64 .31
18	181B	60	41.97 .14	38.74 .16	35.98 .19	33.58 .21	31.48 .24	29.63 .28	27.98 .31
18	182B	65	43.94 .14	40.56 .16	37.66 .19	35.15 .21	32.95 .24	31.01 .28	29.29 .31
18	183B	70	48.48 .14	44.75 .16	41.55 .19	38.78 .21	36.36 .24	34.22 .28	32.32 .31
18	184B	75	50.54 .14	46.66 .16	43.32 .19	40.44 .21	37.91 .24	35.68 .28	33.70 .31
18	185B	80	52.51 .14	48.47 .16	45.01 .19	42.01 .21	39.38 .24	37.07 .28	35.01 .31
18	186B	85	57.49 .14	53.07 .16	49.28 .19	45.99 .21	43.12 .24	40.58 .28	38.33 .31
18	187B	90	59.41 .14	54.84 .16	50.92 .19	47.53 .21	44.56 .24	41.94 .28	39.61 .31

PENCOYD I BEAMS.

Small figures give corresponding deflection in inches. For one half load at centre reduce deflection one-fifth.

Length of Span in Feet.							*Weight per Foot in Pounds.*	*Section Number.*	*Size in Inches.*
20	22	24	26	28	30	32			
Safe Load in Tons.									
37.85 .23	37.85 .31	37.85 .40	36.09 .48	33.51 .56	31.28 .64	29.33 .73	80	240B	24
48.48 .29	44.07 .35	40.40 .41	37.29 .48	34.63 .56	32.32 .64	30.30 .73	85	241B	24
50.04 .29	45.49 .35	41.70 .41	38.49 .48	35.75 .56	33.36 .64	31.28 .73	90	242B	24
31.46 .34	28.60 .41	26.22 .49	24.20 .58	22.47 .67	20.97 .77	19.66 .88	65	200B	20
32.78 .34	29.80 .41	27.31 .49	25.21 .58	23.41 .67	21.85 .77	20.48 .88	70	201B	20
34.07 .34	30.98 .41	28.39 .49	26.21 .58	24.33 .67	22.72 .77	21.30 .88	75	202B	20
37.45 .34	34.05 .41	31.21 .49	28.81 .58	26.75 .67	24.97 .77	23.41 .88	80	203B	20
38.75 .34	35.23 .41	32.29 .49	29.81 .58	27.68 .67	25.83 .77	24.22 .88	85	204B	20
40.05 .34	36.41 .41	33.37 .49	30.80 .58	28.60 .67	26.70 .77	25.03 .88	90	205B	20
43.20 .34	39.28 .41	36.00 .49	33.23 .58	30.86 .67	28.80 .77	27.00 .88	95	206B	20
44.49 .34	40.44 .41	37.07 .49	34.22 .58	31.78 .67	29.66 .77	27.81 .88	100	207B	20
23.97 .38	21.79 .46	19.98 .55	18.44 .64	17.12 .75	15.98 .86	14.98 .98	55	180B	18
25.18 .38	22.89 .46	20.99 .55	19.37 .64	17.99 .75	16.79 .86	15.74 .98	60	181B	18
26.36 .38	23.97 .46	21.97 .55	20.28 .64	18.83 .75	17.58 .86	16.48 .98	65	182B	18
29.09 .38	26.44 .46	24.24 .55	22.38 .64	20.78 .75	19.39 .86	18.18 .98	70	183B	18
30.33 .38	27.57 .46	25.27 .55	23.33 .64	21.66 .75	20.22 .86	18.95 .98	75	184B	18
31.51 .38	28.64 .46	26.26 .55	24.24 .64	22.51 .75	21.01 .86	19.69 .98	80	185B	18
34.49 .38	31.36 .46	28.75 .55	26.53 .64	24.64 .75	23.00 .86	21.56 .98	85	186B	18
35.65 .38	32.41 .46	29.70 .55	27.42 .64	25.46 .75	23.76 .86	22.28 .98	90	187B	18

PENCOYD I BEAMS.

Greatest safe loads in tons evenly distributed, including beam itself. For concentrated load in middle of beam take one half amount in table.

Size in Inches.	Section Number.	Weight per Foot in Pounds.	Length of Span in Feet.						
			10	11	12	13	14	15	16
			Safe Load in Tons.						
15	150B	42.0	23.81 .09	23.81 .11	23.81 .15	23.81 .19	22.54 .22	21.04 .26	19.72 .29
15	151B	45.0	31.16 .11	29.76 .14	27.28 .16	25.18 .19	23.38 .22	21.82 .26	20.46 .29
15	152B	50.0	35.14 .11	33.31 .14	30.53 .16	28.18 .19	26.17 .22	24.43 .26	22.90 .29
15	153B	55.0	38.60 .11	35.09 .14	32.17 .16	29.69 .19	27.57 .22	25.74 .26	24.13 .29
15	154B	60.0	44.02 .11	40.02 .14	36.68 .16	33.86 .19	31.44 .22	29.35 .26	27.51 .29
15	155B	65.0	45.98 .11	41.80 .14	38.32 .16	35.37 .19	32.84 .22	30.65 .26	28.74 .29
15	156B	70.0	51.11 .11	46.46 .14	42.59 .16	39.31 .19	36.51 .22	34.07 .26	31.94 .29
15	157B	75.0	53.05 .11	48.23 .14	44.21 .16	40.81 .19	37.89 .22	35.37 .26	33.16 .29
15	158B	80.0	55.03 .11	50.03 .14	45.86 .16	42.33 .19	39.31 .22	36.69 .26	34.39 .29
12	120B	31.5	17.83 .13	17.67 .17	16.20 .21	14.95 .24	13.89 .28	12.96 .32	12.15 .37
12	121B	35.0	20.53 .14	18.66 .17	17.11 .21	15.79 .24	14.66 .28	13.69 .32	12.83 .37
12	122B	40.0	24.42 .14	22.20 .17	20.35 .21	18.78 .24	17.44 .28	16.28 .32	15.26 .37
12	123B	45.0	25.98 .14	23.62 .17	21.65 .21	19.98 .24	18.56 .28	17.32 .32	16.24 .37
12	124B	50.0	29.52 .14	26.83 .17	24.60 .21	22.71 .24	21.08 .28	19.68 .32	18.45 .37
12	125B	55.0	32.72 .14	29.74 .17	27.26 .21	25.17 .24	23.37 .28	21.81 .32	20.45 .37
12	126B	60.0	34.29 .14	31.17 .17	28.58 .21	26.38 .24	24.49 .28	22.86 .32	21.43 .37
12	127B	65.0	35.87 .14	32.61 .17	29.89 .21	27.59 .24	25.62 .28	23.91 .32	22.42 .37

PENCOYD I BEAMS.

Small figures give corresponding deflection in inches. For one half load at centre reduce deflection one-fifth. Deflection below black line is excessive.

Length of Span in Feet.							*Weight per Foot in Pounds.*	*Section Number.*	*Size in Inches.*
18	20	22	24	26	28	30			
Safe Load in Tons.									
17.53 .37	15.78 .46	14.34 .55	13.15 .66	12.14 .77	11.27 .90	10.52 1.0	42.0	150B	15
18.18 .37	16.37 .46	14.88 .55	13.64 .66	12.59 .77	11.69 .90	10.91 1.0	45.0	151B	15
20.35 .37	18.32 .46	16.65 .55	15.27 .66	14.09 .77	13.09 .90	12.21 1.0	50.0	152B	15
21.45 .37	19.30 .46	17.55 .55	16.08 .66	14.85 .77	13.79 .90	12.87 1.0	55.0	153B	15
24.46 .37	22.01 .46	20.01 .55	18.34 .66	16.93 .77	15.72 .90	14.67 1.0	60.0	154B	15
25.54 .37	22.99 .46	20.90 .55	19.16 .66	17.68 .77	16.42 .90	15.33 1.0	65.0	155B	15
28.39 .37	25.55 .46	23.23 .55	21.30 .66	19.66 .77	18.25 .90	17.04 1.0	70.0	156B	15
29.47 .37	26.52 .46	24.11 .55	22.10 .66	20.40 .77	18.95 .90	17.68 1.0	75.0	157B	15
30.57 .37	27.51 .46	25.01 .55	22.93 .66	21.17 .77	19.65 .90	18.34 1.0	80.0	158B	15
10.80 .46	9.72 .57	8.84 .69	8.10 .82	7.48 .97	6.94 1.1	6.48 1.3	31.5	120B	12
11.41 .46	10.26 .57	9.33 .69	8.55 .82	7.90 .97	7.33 1.1	6.84 1.3	35.0	121B	12
13.56 .46	12.21 .57	11.10 .69	10.17 .82	9.39 .97	8.72 1.1	8.14 1.3	40.0	122B	12
14.43 .46	12.99 .57	11.81 .69	10.82 .82	9.99 .97	9.28 1.1	8.66 1.3	45.0	123B	12
16.40 .46	14.76 .57	13.42 .69	12.30 .82	11.35 .97	10.54 1.1	9.84 1.3	50.0	124B	12
18.17 .46	16.36 .57	14.87 .69	13.63 .82	12.58 .97	11.68 1.1	10.91 1.3	55.0	125B	12
19.05 .46	17.15 .57	15.59 .69	14.29 .82	13.19 .97	12.25 1.1	11.43 1.3	60.0	126B	12
19.93 .46	17.93 .57	16.30 .69	14.94 .82	13.79 .97	12.81 1.1	11.96 1.3	65.0	127B	12

PENCOYD I BEAMS.

Greatest safe loads in tons evenly distributed, including beam itself. For concentrated load in middle of beam take one half amount in table.

Size in Inches.	Section Number.	Weight per Foot in Pounds.	Length of Span in Feet.						
			5	6	7	8	9	10	11
			Safe Load in Tons.						
10	100B	25.	13.53 .02	13.53 .04	13.53 .06	13.53 .09	13.53 .13	13.13 .17	11.93 .21
10	101B	30.	26.63 .04	24.08 .06	20.63 .08	18.06 .11	16.05 .14	14.44 .17	13.13 .21
10	102B	35.	26.18 .03	26.18 .06	24.86 .08	21.75 .11	19.34 .14	17.40 .17	15.82 .21
10	103B	40.	37.44 .04	31.20 .06	26.74 .08	23.40 .11	20.80 .14	18.72 .17	17.02 .21
9	90B	21.	10.56 .02	10.56 .04	10.56 .07	10.56 .10	10.56 .14	10.07 .19	9.15 .23
9	91B	25.	20.89 .05	18.34 .07	15.72 .09	13.75 .12	12.22 .15	11.00 .19	10.00 .23
9	92B	30.	24.37 .05	20.31 .07	17.41 .09	15.23 .12	13.54 .15	12.18 .19	11.08 .23
9	93B	35.	26.73 .05	22.27 .07	19.09 .09	16.71 .12	14.85 .15	13.36 .19	12.15 .23
8	80B	18.	9.72 .03	9.72 .06	9.72 .09	9.56 .14	8.50 .17	7.65 .21	6.95 .26
8	81B	20.5	16.25 .05	13.62 .08	11.67 .10	10.22 .14	9.08 .17	8.17 .21	7.43 .26
8	82B	23.0	17.39 .05	14.49 .08	12.42 .10	10.87 .14	9.66 .17	8.70 .21	7.90 .26
8	83B	25.5	18.44 .05	15.37 .08	13.17 .10	11.52 .14	10.24 .17	9.22 .21	8.38 .26
7	70B	15.0	8.58 .05	8.58 .08	7.97 .12	6.97 .16	6.20 .20	5.58 .24	5.07 .30
7	71B	17.5	12.06 .06	10.05 .09	8.62 .12	7.54 .16	6.70 .20	6.03 .24	5.48 .30
7	72B	20.0	12.97 .06	10.81 .09	9.26 .12	8.11 .16	7.20 .20	6.48 .24	5.89 .30

PENCOYD I BEAMS.

Small figures give corresponding deflection in inches. For one half load at centre reduce deflection one-fifth. Deflection below black line is excessive.

Length of Span in Feet.							*Weight per Foot in Pounds.*	*Section Number.*	*Size in Inches.*
12	14	16	18	20	22	24			
Safe Load in Tons.									
10.94 .25	9.38 .34	8.20 .44	7.29 .56	6.56 .69	5.97 .83	5.47 .99	25.	100B	10
12.04 .25	10.32 .34	9.03 .44	8.02 .56	7.22 .69	6.57 .83	6.02 .99	30.	101B	10
14.50 .25	12.43 .34	10.88 .44	9.67 .56	8.70 .69	7.91 .83	7.25 .99	35.	102B	10
15.60 .25	13.37 .34	11.70 .44	10.40 .56	9.36 .69	8.51 .83	7.80 .99	40.	103B	10
8.39 .27	7.19 .37	6.29 .49	5.59 .62	5.03 .76	4.58 .92	4.19 1.1	21.	90B	9
9.17 .27	7.86 .37	6.88 .49	6.11 .62	5.50 .76	5.00 .92	4.58 1.1	25.	91B	9
10.15 .27	8.70 .37	7.62 .49	6.77 .62	6.09 .76	5.54 .92	5.08 1.1	30.	92B	9
11.14 .27	9.55 .37	8.35 .49	7.42 .62	6.68 .76	6.07 .92	5.57 1.1	35.	93B	9
6.37 .31	5.46 .42	4.78 .55	4.25 .69	3.82 .86	3.48 1.0	3.19 1.2	18.	80B	8
6.81 .31	5.84 .42	5.11 .55	4.54 .69	4.09 .86	3.71 1.0	3.41 1.2	20.5	81B	8
7.25 .31	6.21 .42	5.43 .55	4.83 .69	4.35 .86	3.95 1.0	3.62 1.2	23.0	82B	8
7.68 .31	6.58 .42	5.76 .55	5.12 .69	4.61 .86	4.19 1.0	3.84 1.2	25.5	83B	8
4.65 .35	3.99 .48	3.49 .63	3.10 .79	2.79 .98	2.54 1.2	2.32 1.4	15.0	70B	7
5.03 .35	4.31 .48	3.77 .63	3.35 .79	3.02 .98	2.74 1.2	2.51 1.4	17.5	71B	7
5.40 .35	4.63 .48	4.06 .63	3.60 .79	3.24 .98	2.95 1.2	2.70 1.4	20.0	72B	7

PENCOYD I BEAMS.

Greatest safe loads in tons evenly distributed, including beam itself. For concentrated load in middle of beam take one half amount in table.

Size in Inches.	*Section Number.*	*Weight per Foot in Pounds.*	*Length of Span in Feet.*						
			4	5	6	7	8	9	10
			Safe Load in Tons.						
6	60B	12.25	6.90 .03	6.90 .06	6.55 .10	5.61 .14	4.91 .18	4.36 .23	3.93 .29
6	61B	14.75	10.79 .05	8.63 .07	7.19 .10	6.17 .14	5.40 .18	4.80 .23	4.32 .29
6	62B	17.25	11.78 .05	9.42 .07	7.85 .10	6.73 .14	5.89 .18	5.23 .23	4.71 .29
5	50B	9.75	5.51 .05	5.17 .09	4.31 .12	3.69 .17	3.23 .22	2.87 .28	2.59 .34
5	51B	12.25	7.29 .05	5.83 .09	4.86 .12	4.16 .17	3.64 .22	3.24 .28	2.91 .34
5	52B	14.75	8.10 .05	6.48 .09	5.40 .12	4.63 .17	4.05 .22	3.60 .28	3.24 .34
4	40B	7.50	3.93 .07	3.15 .11	2.62 .15	2.25 .21	1.97 .27	1.75 .35	1.57 .43
4	41B	8.50	4.19 .07	3.36 .11	2.80 .15	2.40 .21	2.10 .27	1.86 .35	1.68 .43
4	42B	9.50	4.45 .07	3.56 .11	2.97 .15	2.55 .21	2.23 .27	1.98 .35	1.78 .43
4	43B	10.50	4.71 .07	3.77 .11	3.14 .15	2.69 .21	2.36 .27	2.09 .35	1.89 .43
3	30B	5.50	2.16 .09	1.73 .14	1.44 .21	1.23 .28	1.08 .37	.96 .46	.86 .57
3	31B	6.50	2.35 .09	1.88 .14	1.57 .21	1.34 .28	1.17 .37	1.04 .46	.94 .57
3	32B	7.50	2.55 .09	2.04 .14	1.70 .21	1.46 .28	1.28 .37	1.13 .46	1.02 .57

PENCOYD I BEAMS.

Small figures give corresponding deflection in inches. For one half load at centre reduce deflection one-fifth. Deflection below black line is excessive.

Length of Span in Feet.							*Weight per Foot in Pounds.*	*Section Number.*	*Size in Inches.*
11	12	13	14	15	16	17			
Safe Load in Tons.									
3.57 .35	3.27 .41	3.02 .48	2.81 .56	2.62 .64	2.45 .74	2.31 .83	12.25	60B	6
3.92 .35	3.60 .41	3.32 .48	3.08 .56	2.88 .64	2.70 .74	2.54 .83	14.75	61B	6
4.28 .35	3.93 .41	3.62 .48	3.37 .56	3.14 .64	2.94 .74	2.77 .83	17.25	62B	6
2.35 .41	2.16 .49	1.99 .58	1.85 .67	1.72 .77	1.62 .89	1.52 .99	9.75	50B	5
2.65 .41	2.43 .49	2.24 .58	2.08 .67	1.94 .77	1.82 89	1.71 .99	12.25	51B	5
2.94 .41	2.70 .49	2.49 .58	2.31 .67	2.16 .77	2.02 .89	1.90 .99	14.75	52B	5
1.43 .52	1.31 .62	1.21 .72	1.12 .84	1.05 .96	.98 1.1	.93 1.2	7.50	40B	4
1.52 .52	1.40 .62	1.29 .72	1.20 .84	1.12 .96	1.05 1.1	.99 1.2	8.50	41B	4
1.62 .52	1.48 .62	1.37 .72	1.27 .84	1.19 .96	1.11 1.1	1.05 1.2	9.50	42B	4
1.71 .52	1.57 .62	1.45 .72	1.35 .84	1.26 .96	1.18 1.1	1.11 1.2	10.50	43B	4
.79 .69	.72 .82	.66 .97	.62 1.1	.58 1.3	.54 1.5	.51 1.7	5.50	30B	3
.85 .69	.78 .82	.72 .97	.67 1.1	.63 1.3	.59 1.5	.55 1.7	6.50	31B	3
.93 .69	.85 .82	.78 .97	.73 1.1	.68 1.3	.64 1.5	.60 1.7	7.50	32B	3

PENCOYD CHANNELS.

Greatest safe loads in tons evenly distributed, including beam itself. For concentrated load in middle of beam take one half amount in table.

Size in Inches.	Section Number.	Weight per Foot in Pounds.	Length of Span in Feet.							
			8	9	10	11	12	13	14	15
			Safe Load in Tons.							
15	150C	33.0	22.49	22.49	22.13	20.12	18.44	17.02	15.81	14.75
15	151C	35.0	27.37	25.48	22.93	20.85	19.11	17.64	16.38	15.29
15	152C	40.0	31.11	27.66	24.89	22.63	20.74	19.15	17.78	16.59
15	153C	45.0	33.56	29.83	26.85	24.41	22.38	20.65	19.18	17.90
15	154C	50.0	39.32	34.95	31.45	28.59	26.21	24.19	22.47	20.97
15	155C	55.0	41.76	37.12	33.41	30.37	27.84	25.70	23.87	22.27
			.07	.09	.11	.14	.16	.19	.22	.26
12	120C	20.5	11.72	11.72	11.49	10.45	9.58	8.84	8.21	7.66
12	121C	25.0	16.12	14.33	12.90	11.73	10.75	9.92	9.21	8.60
12	122C	30.0	18.09	16.08	14.47	13.16	12.06	11.13	10.34	9.65
12	123C	35.0	23.08	20.51	18.46	16.78	15.38	14.20	13.19	12.31
12	124C	40.0	25.03	22.25	20.02	18.20	16.69	15.40	14.30	13.35
12	128C	20.5	12.08	12.08	11.02	10.02	9.18	8.48	7.87	7.35
12	128C	32.0	18.26	16.23	14.60	13.28	12.17	11.23	10.43	9.74
			.09	.12	.14	.17	.21	.24	.28	.32
10	100C	15.0	8.22	7.95	7.16	6.51	5.97	5.51	5.11	4.77
10	101C	20.0	10.58	9.41	8.47	7.70	7.05	6.51	6.05	5.64
10	102C	25.0	13.35	11.87	10.68	9.71	8.90	8.21	7.63	7.12
10	103C	30.0	14.98	13.32	11.99	10.90	9.99	9.22	8.56	7.99
10	104C	35.0	16.61	14.77	13.29	12.08	11.08	10.22	9.49	8.86
			.11	.14	.17	.21	.25	.29	.34	.39
9	90C	13.25	7.10	6.31	5.68	5.16	4.73	4.37	4.05	3.78
9	91C	15.0	7.61	6.76	6.09	5.53	5.07	4.68	4.35	4.06
9	92C	20.0	9.92	8.82	7.94	7.22	6.61	6.11	5.67	5.29
9	93C	25.0	11.40	10.13	9.12	8.29	7.60	7.01	6.51	6.08
			.12	.15	.19	.23	.27	.32	.37	.43

PENCOYD CHANNELS.

Small figures give deflection in inches for loads above. For one half load at centre reduce deflection one-fifth. Deflection below black line is excessive.

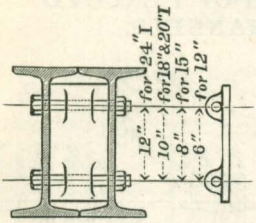
Length of Span in Feet.									*Size in Inches.*
16	18	20	22	24	26	28	30	32	
Safe Load in Tons.									
13.83	12.29	11.07	10.06	9.22	8.51	7.90	7.38	6.92	15
14.33	12.74	11.47	10.42	9.55	8.82	8.19	7.64	7.17	15
15.56	13.83	12.45	11.31	10.37	9.57	8.89	8.30	7.78	15
16.78	14.92	13.43	12.20	11.19	10.33	9.59	8.95	8.39	15
19.66	17.47	15.73	14.30	13.11	12.10	11.23	10.48	9.83	15
20.88	18.56	16.71	15.19	13.92	12.85	11.93	11.14	10.44	15
.29	.37	.46	.55	.66	.77	.90	1.0	1.2	
7.18	6.38	5.75	5.22	4.79	4.42	4.10	3.83	3.59	12
8.06	7.17	6.45	5.86	5.37	4.96	4.61	4.30	4.03	12
9.05	8.04	7.24	6.58	6.03	5.57	5.17	4.83	4.52	12
11.54	10.26	9.23	8.39	7.69	7.10	6.59	6.15	5.77	12
12.51	11.12	10.01	9.10	8.34	7.70	7.15	6.67	6.26	12
6.89	6.12	5.51	5.01	4.59	4.24	3.94	3.67	3.44	12
9.13	8.11	7.30	6.64	6.09	5.62	5.22	4.87	4.56	12
.37	.46	.57	.69	.82	.97	1.1	1.3	1.5	
4.47	3.98	3.58	3.25	2.98	2.75	2.56	2.39	2.24	10
5.29	4.70	4.23	3.85	3.53	3.26	3.02	2.82	2.65	10
6.67	5.93	5.34	4.85	4.45	4.11	3.81	3.56	3.34	10
7.49	6.66	5.99	5.45	4.99	4.61	4.28	4.00	3.75	10
8.31	7.38	6.65	6.04	5.54	5.11	4.75	4.43	4.15	10
.44	.56	.69	.83	.99	1.2	1.3	1.5	1.8	
3.55	3.15	2.84	2.58	2.37	2.18	2.03	1.89	1.77	9
3.80	3.38	3.04	2.77	2.54	2.34	2.17	2.03	1.90	9
4.96	4.41	3.97	3.61	3.31	3.05	2.83	2.65	2.48	9
5.70	5.07	4.56	4.14	3.80	3.51	3.26	3.04	2.85	9
.49	.62	.76	.92	1.1	1.3	1.5	1.7	2.0	

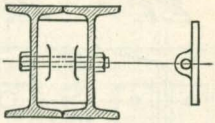
PENCOYD CHANNELS.

Greatest safe distributed load in tons including beam.
Small figures give deflection in inches for loads above.
For one half load at centre reduce deflection one-fifth.
Deflection below black line is excessive.

Size in Inches.	*Section Number.*	*Weight in Pounds per Foot.*	*Length of Span in Feet.*							
			5	6	7	8	10	12	14	16
			Safe Load in Tons.							
8	80C	11.25	6.83	6.83	6.19	5.42	4.33	3.61	3.10	2.71
8	81C	13.75	9.71	8.10	6.94	6.07	4.86	4.05	3.47	3.04
8	82C	16.25	11.73	9.78	8.38	7.33	5.87	4.89	4.19	3.67
8	83C	18.75	12.78	10.65	9.13	7.99	6.39	5.33	4.56	3.99
8	84C	21.25	13.83	11.52	9.88	8.64	6.91	5.76	4.94	4.32
			.05	.08	.10	.14	.21	.31	.42	.55
7	70C	9.75	6.51	5.43	4.65	4.07	3.26	2.71	2.33	2.04
7	71C	12.25	7.43	6.19	5.31	4.64	3.71	3.09	2.65	2.32
7	72C	14.75	9.10	7.58	6.50	5.69	4.55	3.79	3.25	2.84
7	73C	17.25	10.01	8.34	7.15	6.26	5.01	4.17	3.58	3.13
7	74C	19.75	10.92	9.10	7.80	6.83	5.46	4.55	3.90	3.41
			.06	.09	.12	.16	.24	.35	.48	.63
6	60C	8.00	4.65	3.87	3.32	2.90	2.32	1.94	1.66	1.45
6	61C	10.50	5.77	4.81	4.12	3.61	2.89	2.40	2.06	1.80
6	62C	13.00	6.55	5.46	4.68	4.10	3.28	2.73	2.34	2.05
6	63C	15.50	7.34	6.12	5.24	4.59	3.67	3.06	2.62	2.29
			.07	.10	.14	.18	.29	.41	.56	.73
5	50C	6.50	3.14	2.62	2.25	1.97	1.57	1.31	1.12	.98
5	51C	9.00	3.80	3.16	2.71	2.37	1.90	1.58	1.36	1.19
5	52C	11.50	4.45	3.71	3.18	2.78	2.23	1.85	1.59	1.39
			.09	.12	.17	.22	.34	.49	.67	.88
4	40C	5.25	1.99	1.66	1.42	1.25	1.00	.83	.71	.62
4	41C	6.25	2.20	1.84	1.57	1.38	1.10	.92	.79	.69
4	42C	7.25	2.41	2.01	1.72	1.51	1.21	1.00	.86	.75
			.11	.15	.21	.27	.43	.62	.84	1.1
3	30C	4.00	1.14	.95	.82	.72	.57	.48	.41	.36
3	31C	5.00	1.30	1.08	.93	.81	.65	.54	.46	.41
3	32C	6.00	1.46	1.21	1.04	.91	.73	.61	.52	.46
			.14	.21	.28	.37	.57	.82	1.1	1.4

STANDARD SEPARATORS FOR PENCOYD I BEAMS.

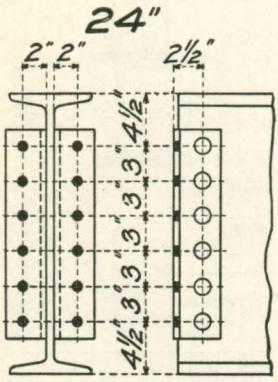




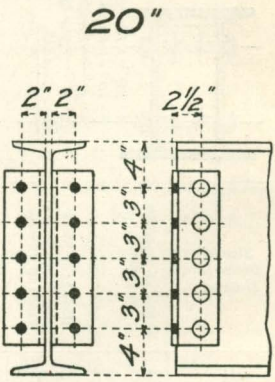
Size of Beam in Inches.	Weight of Separator in Pounds.	Weight of Each Additional Inch of Width in Pounds.	Bolts.		Weight of Each Complete Bolt in Pounds.	Weight of Each Additional Inch of Length in Pounds.
			Number.	Size in Inches.		
24	28.0	4.50	2	3/4	1.42	.124
20	23.0	3.20	2	3/4	1.35	.124
18	21.0	3.20	2	3/4	1.30	.124
15	14.75	1.90	2	3/4	1.20	.124
12	9.75	1.50	2	3/4	1.14	.124
10	6.50	1.20	1	3/4	1.08	.124
9	5.75	1.10	1	3/4	1.04	.124
8	4.50	1.00	1	3/4	1.01	.124
7	3.75	0.90	1	3/4	0.95	.124
6	2.25	0.65	1	3/4	0.93	.124
5	2.00	0.55	1	3/4	0.90	.124
4	1.75	0.45	1	3/4	0.80	.124

Separators for 18″, 20″ and 24″ Beams are made of $\frac{5}{8}$″ metal.
Separators for 3″ to 15″ Beams are made of $\frac{1}{2}$″ metal.

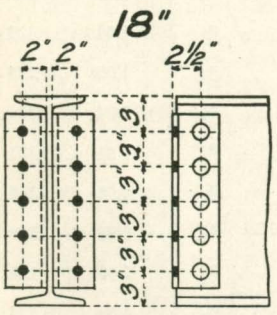
STANDARD FRAMING OF PENCOYD BEAMS AND CHANNELS.



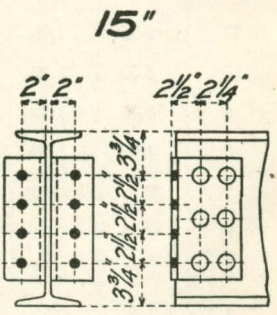
2 Angles 4"x3½"x7/16"x18"



2 Angles 4"x3½"x7/16"x15"

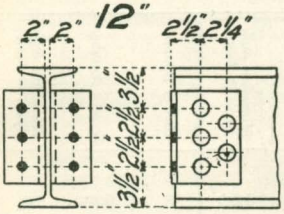


2 Angles 4"x3½"x7/16"x15"

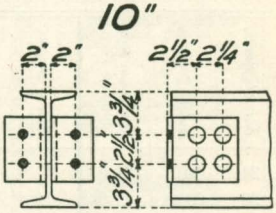


2 Angles 6"x3½"x7/16"x10½"

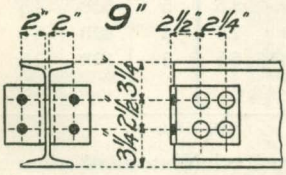
STANDARD FRAMING OF PENCOYD BEAMS AND CHANNELS.



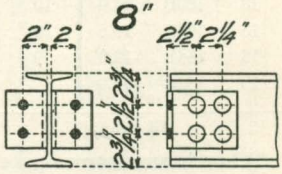
2 Angles 6" x 3½" x 7/16" x 8"



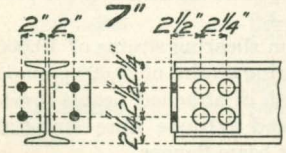
2 Angles 6" x 3½" x 7/16" x 5"



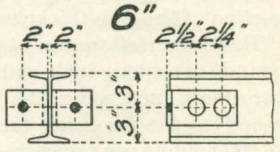
2 Angles 6" x 3½" x 7/16" x 5"



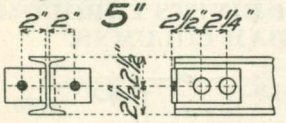
2 Angles 6" x 3½" x 7/16" x 5"



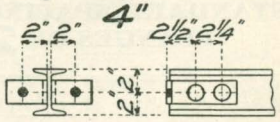
2 Angles 6" x 3½" x 7/16" x 5"



2 Angles 6" x 3½" x 7/16" x 3"



2 Angles 6" x 3½" x 7/16" x 3"



2 Angles 6" x 3½" x 7/16" x 2"

STANDARD ANGLE CONNECTIONS.

The connections illustrated on preceding pages are proportioned, for a load uniformly distributed over a minimum length of span as given below:

Size of Beams.	*Section Number.*	*Minimum Safe Span in Feet.*	*Size of Beams.*	*Section Number.*	*Minimum Safe Span in Feet.*	*Size of Beams.*	*Section Number.*	*Minimum Safe Span in Feet.*
24	240B	19.0						
20	203B	17.5	12	124B	12.0	8	80B	5.0
20	200B	16.0	12	122B	9.0	7	70B	4 0
18	183B	16.0	12	120B	7.5	6	67B	6.0
18	180B	14.0	10	102B	8.5	5	50B	4.5
15	156B	14.5	10	100B	7.0	4	40B	3.0
15	154B	12.0	9	90B	5.5	3	30B	2.0
15	152B	10.0						

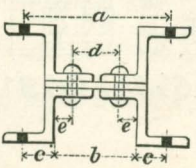
All holes $\frac{13}{16}$″. All rivets $\frac{3}{4}$″.

When beams frame opposite each other into another beam or girder with web thickness less than $\frac{9}{16}$″, the above given minimum lengths of spans ought to be increased in the proportion of the web thickness to $\frac{9}{16}$″.

These connections are based on shearing strains of 10,000 pounds per square inch, and bearing strains of 20,000 pounds per square inch, when the length of attached beams correspond to the foregoing table, and extreme fibre stress of 16,000 pounds per square inch at beam flanges.

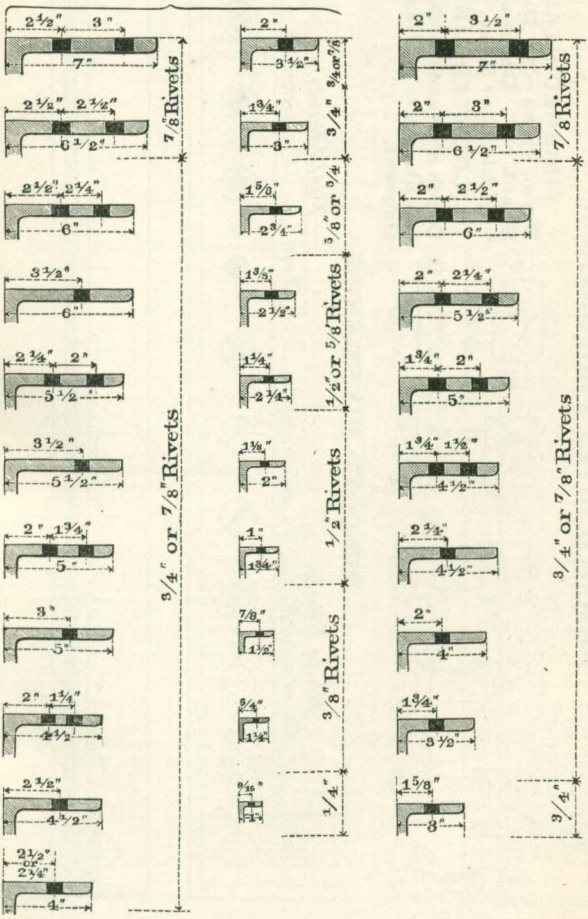
STANDARD SPACING of RIVETS THROUGH FLANGES OF Z BAR COLUMNS.

Size of Z Bar.	*a.*	*b.*	*c.*	*d.*	*e.*
6 inch.	$11\frac{1}{4}$	$7\frac{1}{4}$	2	$4\frac{1}{4}$	$1\frac{1}{2}$
5 "	10	$6\frac{1}{2}$	$1\frac{3}{4}$	4	$1\frac{1}{4}$
4 "	$8\frac{3}{4}$	$5\frac{1}{2}$	$1\frac{5}{8}$	3	$1\frac{1}{4}$
3 "	$7\frac{3}{4}$	$4\frac{3}{4}$	$1\frac{1}{2}$	$2\frac{1}{2}$	$1\frac{1}{8}$

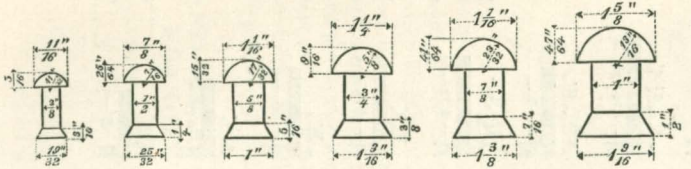


ALL RIVETS $\frac{3}{4}$ INCH.

RIVET SPACING IN PENCOYD ANGLES.



PENCOYD RIVET PROPORTIONS.



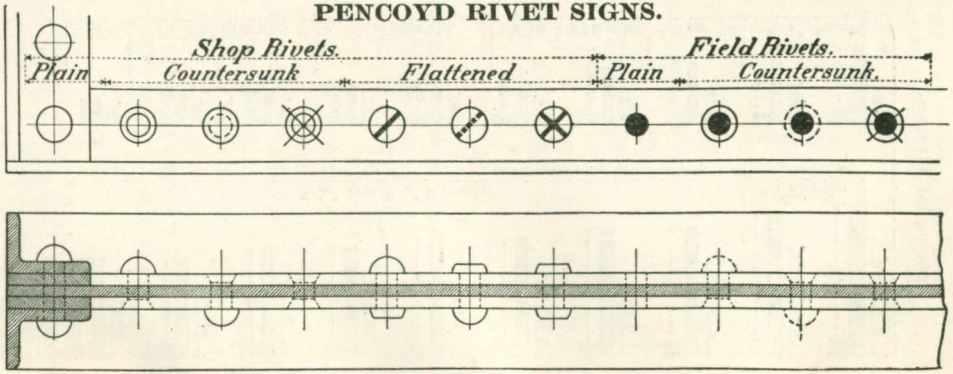
FINISHED HEADS.

Diam. Head = 1½ Diam. of Shank + ⅛". Depth of Head = $\frac{45}{100}$ Diam. of Head.

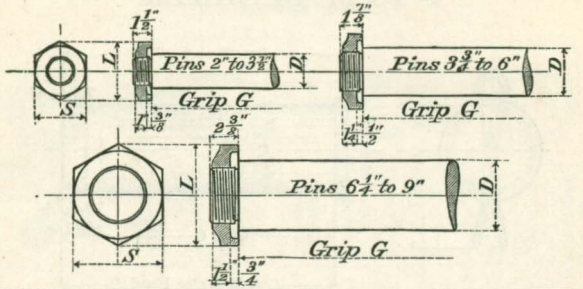
COUNTERSUNK.

Depth of Head = ½ Diam. of Shank. Bevel of Head = 60 Degrees.

PENCOYD RIVET SIGNS.



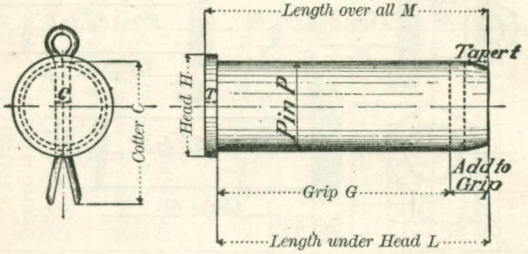
STANDARD PINS AND NUTS FROM 2″ TO 9″ DIAMETER.



PIN.						NUT.				Additional Amt. Added for Grip.	WASHER.		
Diameter of Pin.		Diameter of Pin Hole.	Play in Pin Hole.	Screw. Diameter.	Screw. Length.	Size of Rough Hole.	Short Diameter. S.	Long Diameter. L.	Weight of Nut.		Diameter.	Thickness.	Hole.
2	2.00	2.030	0.030	1½	1½	1 5/16	3¼	3¾	2½	¼	4¼	3/8	2⅛
2¼	2.25	2.280	0.030	1½	1½	1 5/16	3¼	3¾	2½	¼	4¼	3/8	2⅜
2½	2.50	2.530	0.030	2	1½	1 13/16	3¾	4 5/16	3	¼	4¾	3/8	2⅜
2¾	2.75	2.780	0.030	2	1½	1 13/16	3¾	4 5/16	3	¼	5	3/8	2⅝
3	3.00	3.030	0.030	2½	1½	2 5/16	4½	5 5/16	5½	¼	5¾	3/8	3⅛
3¼	3.25	3.280	0.030	2½	1½	2 5/16	4½	5 5/16	5½	¼	5¾	3/8	3⅜
3½	3.50	3.530	0.030	2½	1½	2 5/16	4½	5 5/16	7	¼	6⅛	3/8	3⅜
3¾	3.75	3.771	0.021	3	1⅞	2 13/16	5	5¾	7	½	6½	½	3⅞
4	4.00	4.022	0.022	3	1⅞	2 13/16	5	5¾	8½	½	6¾	½	4⅛
4¼	4.25	4.273	0.023	3½	1⅞	3 5/16	5¾	6⅜	8½	½	7¼	½	4⅜
4½	4.50	4.524	0.024	3½	1⅞	3 5/16	5¾	6⅜	11	½	7¾	½	4⅝
4¾	4.75	4.775	0.025	3½	1⅞	3 5/16	5¾	6⅜	11	½	7¾	½	4⅞
5	5.00	5.026	0.026	4	1⅞	3 13/16	6½	7½	12	½	8	½	5⅛
5¼	5.25	5.277	0.027	4	1⅞	3 13/16	6½	7½	12	½	8⅜	½	5⅜
5½	5.50	5.528	0.028	4½	1⅞	4 5/16	7	8⅛	13½	½	8¾	½	5⅝
5¾	5.75	5.779	0.029	4½	1⅞	4 5/16	7	8⅛	13½	½	9⅛	½	5⅞
6	6.00	6.030	0.030	4½	1⅞	4 5/16	7	8⅛	17	½	9½	½	6⅛
6¼	6.25	6.28	0.030	5	2⅜	4 13/16	7¾	8 15/16		¾	9⅞	5/8	6¾
6½	6.50	6.53	0.030	5	2⅜	4 13/16	7¾	8 15/16		¾	10⅛	5/8	6¾
6¾	6.75	6.78	0.030	5½	2⅜	5 5/16	8¼	9½		¾	10⅜	5/8	6⅞
7	7.00	7.03	0.030	5½	2⅜	5 5/16	8¼	9½		¾	10⅞	5/8	7⅛
7¼	7.25	7.28	0.030	6	2⅜	5 13/16	9	10 3/16		¾	11¼	5/8	7⅜
7½	7.50	7.53	0.030	6	2⅜	5 13/16	9	10 3/8		¾	11½	5/8	7⅜
7¾	7.75	7.78	0.030	6½	2⅜	6 5/16	9¼	11		¾	11⅞	5/8	7⅞
8	8.00	8.03	0.030	6½	2⅜	6 5/16	9¼	11		¾	12⅛	5/8	8⅛
8¼	8.25	8.28	0.030	7	2⅜	6 13/16	10¼	11 13/16		¾	12¾	5/8	8⅜
8½	8.50	8.53	0.030	7	2⅜	6 13/16	10¼	11 13/16		¾	13¼	5/8	8⅜
8¾	8.75	8.78	0.030	7½	2⅜	7 5/16	11	12 13/16		¾	13⅝	5/8	8⅞
9	9.00	9.03	0.030	7½	2⅜	7 5/16	11	12 13/16		¾	14	5/8	9⅛

NOTE.—To obtain grip *G* of pin, add $\frac{1}{8}$ extra for each bar packed together with the proper additional amount given above in the table.

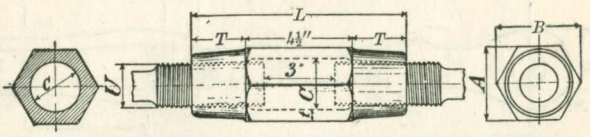
STANDARD COTTER PINS FROM 1″ TO 3¾″ DIAMETER.



Diameter of Pin.		Diameter of Pin Hole.	Play in Pin Hole.	Diameter of Head H.	Thickness of Head T.	Taper at End t.	Length L under Head equal to.	Length M over all equal to.	Size of Cotter C.	Diameter of Pin P.
1	1.00	1.03	0.03	1¼	¼	5/16 x 1/16	G + 5/8	G + 7/8	¼ x 1¾	1
1¼	1.25	1.28	0.03	1½	¼	5/16 x 1/16	G + 5/8	G + 7/8	¼ x 2	1¼
1½	1.50	1.53	0.03	1¾	¼	7/16 x 3/32	G + ¾	G + 1	5/16 x 2½	1½
1¾	1.75	1.78	0.03	2	¼	7/16 x 3/32	G + ¾	G + 1	5/16 x 2¾	1¾
2	2.00	2.03	0.03	2⅜	⅜	½ x ⅛	G + 7/8	G + 1¼	⅜ x 3	2
2¼	2.25	2.28	0.03	2⅝	⅜	½ x ⅛	G + 7/8	G + 1¼	⅜ x 3¼	2¼
2½	2.50	2.53	0.03	2⅞	⅜	5/8 x 5/32	G + 1⅛	G + 1½	7/16 x 3¾	2½
2¾	2.75	2.78	0.03	3⅛	⅜	5/8 x 5/32	G + 1⅛	G + 1½	7/16 x 4	2¾
3	3.00	3.03	0.03	3½	½	¾ x 3/16	G + 1⅜	G + 1⅞	½ x 5	3
3¼	3.25	3.28	0.03	3¾	½	¾ x 3/16	G + 1⅜	G + 1⅞	½ x 5	3¼
3½	3.50	3.53	0.03	4	½	⅞ x 7/32	G + 1⅝	G + 2⅛	⅝ x 6	3½
3¾	3.75	3.78	0.03	4¼	½	⅞ x 7/32	G + 1⅝	G + 2⅛	⅝ x 6	3¾

STANDARD SLEEVE NUTS.

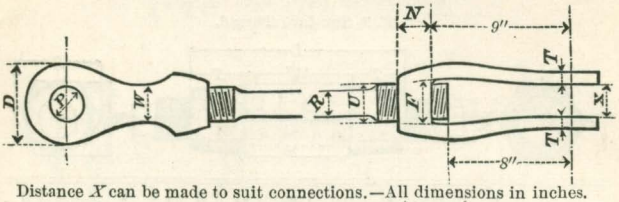
U. S. Standard Thread.



Round Bars.		Square Bars.		Size of Upset.	Length of Thread.	Length of Nut.	Short Diam. Nut.	Long Diam. Nut.	Inside Diam. Nut.	Thickness.	Weight of One Sleeve Nut.
Diam.	Area.	Side.	Area.	U.	T.	L.	A.	B.	C.	t.	Lbs.
5/8	0.307			7/8 x 4	1 1/4	7	1 5/8	1 7/8	1 1/8	1/4	
3/4	0.442			1 x 4	1 1/4	7	1 5/8	1 7/8	1 1/8	1/4	
		3/4	0.563	1 1/8 x 4	1 1/2	7 1/2	2	2 5/16	1 3/8	1/16	3 1/2
7/8	0.601	7/8	0.766	1 1/4 x 4	1 1/2	7 1/2	2	2 5/16	1 3/8	1/16	4
1	0.785			1 3/8 x 4	1 3/4	8	2 3/8	2 3/4	1 5/8	3/8	4 1/2
1 1/8	0.994	1	1.000	1 1/2 x 4	1 3/4	8	2 3/8	2 3/4	1 5/8	3/8	6 1/2
1 1/4	1.227	1 1/8	1.266	1 5/8 x 4 1/2	2	8 1/2	2 3/4	3 1/16	1 7/8	1/16	8
1 3/8	1.485			1 3/4 x 4 1/2	2	8 1/2	2 3/4	3 3/16	1 7/8	7/16	8 1/2
		1 1/4	1.563	1 7/8 x 4 1/2	2 1/4	9	3 1/8	3 5/8	2 1/8	1/2	10
1 1/2	1.767	1 3/8	1.891	2 x 5	2 1/4	9	3 1/8	3 5/8	2 1/8	1/2	11
1 5/8	2.074			2 1/8 x 5	2 1/2	9 1/2	3 1/2	4 1/16	2 3/8	9/16	14
1 3/4	2.405	1 1/2	2.250	2 1/4 x 5	2 1/2	9 1/2	3 1/2	4 1/16	2 3/8	9/16	15
1 7/8	2.761	1 5/8	2.641	2 3/8 x 5 1/2	2 3/4	10	3 7/8	4 1/2	2 5/8	5/8	18
2	3.142	1 3/4	3.063	2 1/2 x 5 1/2	2 3/4	10	3 7/8	4 1/2	2 5/8	5/8	19
2 1/8	3.547			2 5/8 x 5 1/2	3	10 1/2	4 1/4	4 15/16	2 7/8	11/16	22
		1 7/8	3.516	2 3/4 x 6	3	10 1/2	4 1/4	4 15/16	2 7/8	11/16	23
2 1/4	3.976	2	4.000	2 7/8 x 6	3 1/4	11	4 5/8	5 3/8	3 1/8	3/4	27
2 3/8	4.430	2 1/8	4.516	3 x 6	3 1/4	11	4 5/8	5 3/8	3 1/8	3/4	28
2 1/2	4.909			3 1/8 x 6 1/2	3 1/2	11 1/2	5	5 13/16	3 3/8	13/16	34
2 5/8	5.412	2 1/4	5.063	3 1/4 x 6 1/2	3 1/2	11 1/2	5	5 13/16	3 3/8	13/16	35
2 3/4	5.940			3 3/8 x 7	3 3/4	12	5 3/8	6 1/8	3 5/8	7/8	39
		2 3/8	5.641	3 1/2 x 7	3 3/4	12	5 3/8	6 1/8	3 5/8	7/8	40
2 7/8	6.492	2 1/2	6.250	3 5/8 x 8	4	12 1/2	5 3/4	6 11/16	3 7/8	15/16	45
3	7.069			3 3/4 x 8	4	12 1/2	5 3/4	6 11/16	3 7/8	15/16	47
3 1/8	7.670	2 5/8	6.891	3 7/8 x 8	4 1/4	13	6 1/8	7 1/8	4 1/8	1	52
3 1/4	8.296	2 3/4	7.563	4 x 8	4 1/4	13	6 1/8	7 1/8	4 1/8	1	55

PENCOYD STEEL CLEVISES.

PROPORTIONED ACCORDING TO PENCOYD SPECIFICATIONS.

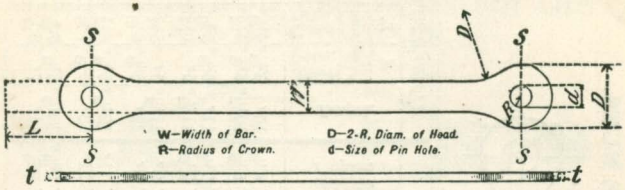


Distance *X* can be made to suit connections.—All dimensions in inches.

Size of Clevis.	Square Rod. R.	Max. Pin. P.	Upset. U.	Diameter of Clevis. D.	Fork. F.	Nut. N.	Width. W.	Thickness. T.	Weight in Pounds.
3½	1	1¾	1½ x 4	3½	1¾	1¾	1¾	½	
3½	⅞	2	1¼ x 4	3½	1¾	1¾	1¾	½	9
3½	¾	2	1⅛ x 4	3½	1¾	1¾	1¾	½	
4½	1¼	2¼	1⅞ x 4½	4½	2	2	2	⅝	
4½	1⅛	2½	1⅝ x 4½	4½	2	2	2	⅝	12½
4½	1	2½	1½ x 4	4½	2	2	2	⅝	
4½	⅞	2½	1¼ x 4	4½	2	2	2	⅝	
5	1⅜	2¼	2 x 5	5	2¼	2¼	2¼	⅝	
5	1¼	2¾	1⅞ x 4½	5	2¼	2¼	2¼	⅝	17
5	1⅛	2¾	1⅝ x 4½	5	2¼	2¼	2¼	⅝	
5	1	3	1½ x 4	5	2¼	2¼	2¼	⅝	
5½	1⅝	2½	2⅜ x 5½	5½	2½	2½	2½	¾	
5½	1½	2¾	2¼ x 5	5½	2½	2½	2½	¾	19
5½	1⅜	3	2 x 5	5½	2½	2½	2½	¾	
5½	1¼	3¼	1⅞ x 4½	5½	2½	2½	2½	¾	
6	1¾	2½	2½ x 5½	6	2¾	2¾	2¾	¾	
6	1⅝	3	2⅜ x 5½	6	2¾	2¾	2¾	¾	25
6	1½	3¼	2¼ x 5	6	2¾	2¾	2¾	¾	
6	1⅜	3½	2 x 5	6	2¾	2¾	2¾	¾	
6½	1⅞	3	2¾ x 6	6½	3	3	3	⅞	
6½	1¾	3¼	2½ x 5½	6½	3	3	3	⅞	30
6½	1⅝	3½	2⅜ x 5½	6½	3	3	3	⅞	
6½	1½	3¾	2¼ x 5	6½	3	3	3	⅞	
7	2	3	2⅞ x 6	7	3¼	3¼	3¼	⅞	
7	1⅞	3½	2¾ x 6	7	3¼	3¼	3¼	⅞	39
7	1¾	3¾	2½ x 5½	7	3¼	3¼	3¼	⅞	
7	1⅝	4	2⅜ x 5½	7	3¼	3¼	3¼	⅞	
7½	2¼	3	3¼ x 6½	7½	3½	3½	3½	1	
7½	2⅛	3½	3 x 6	7½	3½	3½	3½	1	49½
7½	2	4	2⅞ x 6	7½	3½	3½	3½	1	
7½	1⅞	4¼	2¾ x 6	7½	3½	3½	3½	1	

The size of pin given for each combination of bar and clevis is the maximum size allowed, and cannot be increased, but may be decreased.

PENCOYD STEEL EYE BARS.

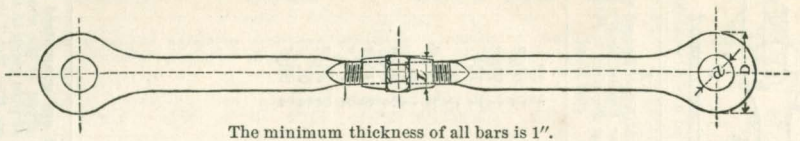


W *Width of Bar.*	*t* *Minimum Thickness of Bar.*	*D* *Diameter of Head.*	*d* *Diameter of Largest Pin.*	*L* *Additional Length of Bar Beyond Centre of Eye Required to Form One Head.*
3″	3/4″	7″	3″	1′ 3″
3″	3/4″	8″	3 7/8″	1′ 5 1/2″
4″	3/4″	9 1/2″	4 1/8″	1′ 7 1/2″
4″	3/4″	10 1/2″	5 1/16″	1′ 10″
5″	3/4″	11 1/2″	4 13/16″	1′ 9″
5″	1″	12 1/2″	5 11/16″	2′ 0 3/4″
6″	3/4″	13 1/2″	5 1/2″	1′ 11″
6″	1″	14 1/2″	6 5/16″	2′ 2 1/4″
7″	7/8″	16″	6 11/16″	2′ 2 3/4″
7″	1 1/8″	17″	7 1/2″	2′ 7 3/4″
8″	1″	17″	6″	2′ 2 3/4″
8″	1 1/16″	18″	7″	2′ 6″
8″	1 1/8″	18 1/2″	7 1/2″	2′ 9 3/4″
9″				
9″				
9″				
10″				
10″				
10″				
12″				
12″				
12″				

NOTE.—Pencoyd eye bars are hydraulic forged, and are guaranteed to develop the full strength of the bar, under conditions given in the above table, when tested to destruction. The maximum sizes of pins given in the above table allow an excess in sectional area of head on line "ss" over that of the body of the bar of 33 per cent. for diameters of pins, not larger than the width of the bar, and 36 per cent. for pins of larger diameter than the width of the bar; the thickness of eye being the same as the thickness of the body of the bar, or not exceeding the same by more than 1/16 of an inch.

The steel manufactured by us for the use of eye bars is open hearth steel, and will be furnished of such quality as to satisfy the demands of engineers.

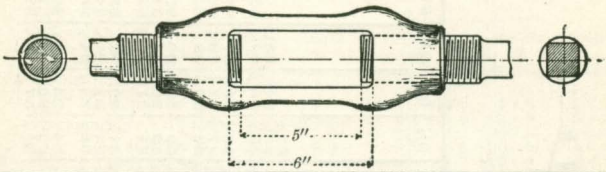
PENCOYD STEEL EYE BARS AND STEEL SLEEVE NUTS.



The minimum thickness of all bars is 1″.

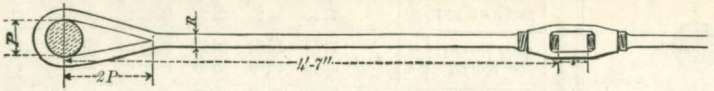
EYE BAR.								UPSET.					SLEEVE NUT.			
Width of Bar.	Thickness of Bar.	Min. Diam. of Head, with Max. Pin allowed. Head D	Pin d	Add for 1 Minimum Head.	Max. Diam. of Head, with Max. Pin allowed. Head D	Pin d	Add for 1 Maximum Head.	Diameter and Length of Screw.	Diameter of Root of Thread. Ins.	Area of Root of Thread. Sq. Ins.	Number of Threads per Inch.	Add for 1 Upset.	Length.	S. Short Diam.	L. Hexagon. Long Diam.	Weight of Sleeve Nut. lbs.
3″	1″ to 1 1/16″	7″	3″	1′ 3″	8″	3 7/8″	1′ 5 1/2″	2 1/2″ x 5 1/2″	2.175	3.719	4″	1′ 4 1/2″	10″	3 7/8″	4 1/2″	19
3″	1 1/8″ to 1 1/4″	7″	3″	1′ 3″	8″	3 7/8″	1′ 5 1/2″	2 3/4″ x 6″	2.425	4.620	4″	1′ 4 1/2″	10 1/2″	4 1/4″	4 13/16″	23
4″	1″ to 1 1/8″	9 1/2″	4 1/8″	1′ 7 1/2″	10 1/2″	5 1/16″	1′ 10″	3″ x 6″	2.629	5.428	3 1/2″	1′ 7 1/2″	11″	4 5/8″	5 3/8″	28
4″	1 3/16″ to 1 3/8″	9 1/2″	4 1/8″	1′ 7 1/2″	10 1/2″	5 1/16″	1′ 10″	3 1/4″ x 6 1/2″	2.879	6.510	3 1/2″	1′ 7 1/2″	11 1/2″	5″	5 13/16″	35
5″	1″ to 1 1/16″	11 1/2″	4 13/16″	1′ 9″	12 1/2″	5 1/16″	2′ 0 3/4″	3 1/4″ x 6 1/2″	2.879	6.510	3 1/2″	1′ 9″	11 1/2″	5″	5 13/16″	35
5″	1 1/8″ to 1 1/4″	11 1/2″	4 13/16″	1′ 9″	12 1/2″	5 1/16″	2′ 0 3/4″	3 1/2″ x 7′	3.100	7.548	3 1/4″	1′ 9″	12″	5 3/8″	6 1/8″	40
6″	1″ to 1 3/16″	13 1/2″	5 1/2″	1′ 11″	14 1/2″	6 5/16″	2′ 2 1/4″	3 3/4″ x 8″	3.317	8.641	3 1/4″	1′ 11″	12 1/2″	5 3/4″	6 11/16″	47
6″	1 1/4″ to 1 3/8″	13 1/2″	5 1/2″	1′ 11″	14 1/2″	6 5/16″	2′ 2 1/4″	4″ x 8″	3.567	9.963	3″	1′ 11″	13″	6 1/8″	7 1/8″	55
7″	1″ to 1 5/16″	16″	6 11/16″	2′ 2 3/4″	17″	7 1/2″	2′ 7 3/4″	4 1/4″ x 9″	3.798	11.33	2 7/8″	2′ 2 3/4″	13 1/2″	6 1/2″	7 9/16″	65
7″	1 3/8″ to 1 1/2″	16″	6 11/16″	2′ 2 3/4″	17″	7 1/2″	2′ 7 3/4″	4 1/2″ x 9″	4.028	12.75	2 3/4″	2′ 2 3/4″	14″	7″	8 1/16″	75

ALLOWANCE FOR UPSETS ON SQUARE AND ROUND BARS.



Round Bars.					*Size of Upset.*						*Square Bars.*				
Diameter.	*Area Square Inches.*	*Weight per Lineal Foot.*	*Add for Upset.*	*Excess of Area @ Root of Thread.*	*Diameter.*	*Length.*	*Diameter at Root of Thread.*	*Area at Root of Thread.*	*Number of Threads per Inch.*	*Weight of One Turnbuckle.*	*Side of Square.*	*Area Square Inches.*	*Weight per Lineal Foot.*	*Add for Upset.*	*Excess of Area @ Root of Thread.*
Ins.		*Lbs.*	*Ins.*	*%*	*Ins.*	*Ins.*	*Ins.*	*Sq. Ins.*		*Lbs.*	*Ins.*		*Lbs.*	*Ins.*	*%*
5/8	0.307	1.04	4 1/2	36.8	7/8	4	0.731	0.420	9	2 1/2					
3/4	0.442	1.50	3 7/8	24.4	1	4	0.837	0.550	8	3 1/2					
					1 1/8	4	0.940	0.694	7	4	3/4	0.563	1.91	3 1/2	20.6
7/8	0.601	2.04	5	48.3	1 1/4	4	1.065	0.891	7	5 1/4	7/8	0.766	2.60	4	16.3
1	0.785	2.67	4 3/8	34.7	1 3/8	4	1.160	1.057	6	6					
1 1/8	0.994	3.38	3 7/8	30.3	1 1/2	4	1.284	1.295	6	7 1/2	1	1.000	3.40	4	29.5
1 1/4	1.227	4.18	3 7/8	23.5	1 5/8	4 1/2	1.389	1.515	5 1/2	8 1/2	1 1/8	1.266	4.30	4 1/2	19.7
1 3/8	1.485	5.05	3 1/2	17.4	1 3/4	4 1/2	1.490	1.744	5	10					
					1 7/8	4 1/2	1.615	2.049	5	11 1/2	1 1/4	1.563	5.31	4 1/2	31.1
1 1/2	1.767	6.01	4 5/8	30.3	2	5	1.712	2.302	4 1/2	13	1 3/8	1.891	6.43	4 1/2	21.7
1 5/8	2.074	7.05	4 1/4	27.8	2 1/8	5	1.837	2.651	4 1/2	15					
1 3/4	2.405	8.18	4	25.7	2 1/4	5	1.962	3.023	4 1/2	18	1 1/2	2.250	7.65	4 3/4	34
1 7/8	2.761	9.39	4 1/8	23.9	2 3/8	5 1/2	2.087	3.410	4	20	1 5/8	2.641	8.98	4 5/8	29.6
2	3.142	10.68	3 7/8	18.3	2 1/2	5 1/2	2.175	3.716	4	24	1 3/4	3.063	10.41	4 1/4	21.3
2 1/8	3.547	12.06	3 5/8	17.1	2 5/8	5 1/2	2.300	4.155	4	28					
					2 3/4	6	2.425	4.619	4	30	1 7/8	3.516	11.95	5 1/8	31.4
2 1/4	3.976	13.52	4 5/8	28.5	2 7/8	6	2.550	5.107	3 1/2	34	2	4.000	13.60	4 3/4	27.7
2 3/8	4.430	15.07	4 3/8	22.6	3	6	2.629	5.430	3 1/2	38	2 1/8	4.516	15.35	4 3/8	20.2
2 1/2	4.909	16.69	4 3/8	21.3	3 1/8	6 1/2	2.754	5.957	3 1/2	50					
2 5/8	5.412	18.40	4 1/4	20.3	3 1/4	6 1/2	2.879	6.510	3 1/2	50	2 1/4	5.063	17.22	5 1/8	28.6
2 3/4	5.940	20.20	4 1/4	19.3	3 3/8	7	3.004	7.088	3 1/4	65					
					3 1/2	7	3.100	7.548	3 1/4	65	2 3/8	5.641	19.18	6 1/8	33.8
2 7/8	6.492	22.07	5 1/2	25.9	3 5/8	8	3.225	8.170	3 1/4		2 1/2	6.250	21.25	6 1/4	30.7
3	7.069	24.03	5 1/4	22.2	3 3/4	8	3.317	8.641	3 1/4						
3 1/8	7.670	26.08	5 1/8	21.3	3 7/8	8	3.442	9.305	3		2 5/8	6.891	23.43	6 3/4	35.0
3 1/4	8.296	28.20	4 7/8	20.7	4	8	3.567	9.9935	3		2 3/4	7.563	25.71	6	25.1

ALLOWANCE FOR EYE FOR SQUARE OR ROUND BARS.



Length in inches beyond pin centre to form one eye.

Diameter of Pin in Inches.	Diameter or Side of Bars in Inches.																		Diameter of Pin in Inches.
	¾	⅞	1	1⅛	1¼	1⅜	1½	1⅝	1¾	1⅞	2	2⅛	2¼	2⅜	2½	2⅝	2¾	2⅞	3	
1	11½	12	12½																	1
1¼	12½	12⅞	13⅜	13⅞	14¼															1¼
1½	13⅜	13⅞	14¼	14¾	15¼	15⅝	16⅛													1½
1¾	14¼	14¾	15¼	15⅝	16⅛	16⅝	17	17½	18											1¾
2	15¼	15⅝	16⅛	16⅝	17	17½	18	18⅜	18⅞	19⅜	19¾									2
2¼	16⅛	16⅝	17	17½	18	18⅝	18⅞	19⅜	19¾	20¼	20¾	21⅛	21⅝							2¼
2½	17	17½	18	18⅜	18⅞	19⅜	19¾	20¼	20¾	21⅛	21⅝	22⅛	22⅝	23	23½					2½
2¾	18	18⅜	18⅞	19⅜	19¾	20¼	20¾	21⅛	21⅝	22⅛	22⅝	23	23½	24	24⅜	24⅞	25⅜			2¾
3	18⅞	19⅜	19¾	20¼	20¾	21⅛	21⅝	22⅛	22⅝	23	23½	24	24⅝	24⅞	25⅜	25⅞	26¼	26¾	27¼	3
3¼	19¾	20¼	20¾	21⅛	21⅝	22⅛	22⅝	23	23½	24	24⅜	24⅞	25⅜	25⅞	26¼	26¾	27¼	27⅝	28⅛	3¼
3½	20¾	21⅛	21⅝	22⅛	22⅝	23	23½	24	24⅜	24⅞	25⅜	25⅞	26¼	26¾	27¼	27⅝	28⅛	28⅝	29	3½
3¾	21⅝	22⅛	22⅝	23	23½	24	24⅜	24⅞	25⅜	25⅞	26¼	26¾	27¼	27⅝	28⅛	28⅝	29	29½	30	3¾
4	22⅝	23	23½	24	24⅜	24⅞	25⅜	25⅞	26¼	26¾	27¼	27⅝	28⅛	28⅝	29	29½	30	30½	31	4
4¼	23½	24	24⅜	24⅞	25⅜	25⅞	26¼	26¾	27¼	27⅝	28⅛	28⅝	29	29½	30	30½	31	31⅛	31⅞	4¼
4½	24⅜	24⅞	25⅜	25⅞	26¼	26¾	27¼	27⅝	28⅛	28⅝	29	29½	30	30½	31	31⅛	31⅞	32¼	32¾	4½
4¾	25⅜	25⅞	26¼	26¾	27¼	27⅝	28⅛	28⅝	29	29½	30	30½	31	31⅜	31⅞	32¼	32¾	33¼	33⅝	4¾
5	26¼	26¾	27¼	27⅝	28⅛	28⅝	29	29½	30	30½	31	31⅜	31⅞	32¼	32¾	33¼	33⅝	34⅛	34⅝	5
5¼	27¼	27⅝	28⅛	28⅝	29	29½	30	30½	31	31⅜	31⅞	32¼	32¾	33¼	33⅝	34⅛	34⅝	35	35½	5¼
5½	28⅛	28⅝	29	29½	30	30½	31	31⅜	31⅞	32¼	32¾	33¼	33⅝	34⅛	34⅝	35	35½	36	36½	5½
5¾	29	29½	30	30½	31	31⅞	31⅞	32¼	32¾	33¼	33⅝	34⅛	34⅝	35	35½	36	36½	37	37⅜	5¾
6	30	30½	31	31⅞	31⅞	32¼	32¾	33¼	33⅝	34⅛	34⅝	35	35½	36	36½	37	37⅜	37⅞	38⅜	6

NOTE.—The maximum shipping length should not exceed 35 feet.

WEIGHT OF BRIDGE RIVETS PER 100.

THIS TABLE ALSO APPLIES TO BUTTON-HEADED BOLTS.

Diameter of Rivet in Inches.	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4
Length of Rivet Under Head in Inches.	*Weight in Pounds.*	*Weight in Pounds.*	*Weight in Pounds.*	*Weight in Pounds.*	*Weight in Pounds.*	*Weight in Pounds.*	*Weight in Pounds.*	*Weight in Pounds.*
1 1/4	5.7	12.8	22.0	29.3	43.9	66.6	93.3	127.1
1 3/8	6.1	13.5	23.1	30.9	46.1	69.4	96.9	131.5
1 1/2	6.5	14.2	24.1	32.4	48.2	72.1	100.4	135.8
1 5/8	6.9	14.8	25.2	34.0	50.3	74.9	103.9	140.2
1 3/4	7.3	15.5	26.3	35.5	52.5	77.7	107.4	144.5
1 7/8	7.7	16.2	27.4	37.1	54.6	80.5	110.9	148.9
2	8.0	16.9	28.5	38.7	56.7	83.3	114.5	153.2
2 1/8	8.4	17.6	29.6	40.2	58.8	86.0	118.0	157.5
2 1/4	8.8	18.3	30.7	41.8	61.0	88.8	121.5	161.9
2 3/8	9.2	19.0	31.7	43.3	63.1	91.6	125.0	166.2
2 1/2	9.6	19.7	32.8	44.9	65.2	94.4	128.5	170.6
2 5/8	10.0	20.4	33.9	46.5	67.4	97.2	132.1	174.9
2 3/4	10.4	21.1	35.0	48.0	69.5	99.9	135.6	179.3
2 7/8	10.8	21.8	36.1	49.6	71.6	102.7	139.1	183.6
3	11.2	22.5	37.2	51.1	73.7	105.5	142.6	188.0
3 1/8	11.6	23.2	38.3	52.7	75.9	108.3	146.1	192.3
3 1/4	11.9	23.9	39.3	54.3	78.0	111.1	149.7	196.7
3 3/8	12.3	24.6	40.4	55.8	80.1	113.8	153.1	201.0
3 1/2	12.7	25.3	41.5	57.4	82.3	116.6	156.7	205.4
3 5/8	13.1	26.0	42.6	58.9	84.4	119.4	160.2	209.7
3 3/4	13.5	26.7	43.7	60.5	86.5	122.2	163.7	214.1
3 7/8	13.9	27.4	44.8	62.1	88.6	125.0	167.3	218.4
4	14.3	28.1	45.9	63.6	90.8	127.8	170.8	222.8
4 1/8	14.7	28.7	46.9	65.2	92.9	130.5	174.3	227.1
4 1/4	15.1	29.4	48.0	66.7	95.0	133.3	177.8	231.4
4 3/8	15.5	30.1	49.1	68.3	97.2	136.1	181.3	235.8
4 1/2	15.8	30.8	50.2	69.9	99.3	138.9	184.9	240.1
4 5/8	16.2	31.5	51.3	71.4	101.4	141.7	188.4	244.5
4 3/4	16.6	32.2	52.4	73.0	103.5	144.4	191.9	248.8
4 7/8	17.0	32.9	53.5	74.5	105.7	147.2	195.4	253.2
5	17.4	33.6	54.5	76.1	107.8	150.0	198.9	257.5
5 1/4	18.2	35.0	56.7	79.2	112.1	155.6	206.0	266.2
5 1/2	19.0	36.4	58.9	82.3	116.3	161.1	213.1	274.9
5 3/4	19.7	37.8	61.1	85.5	120.6	166.7	220.1	283.6
6	20.5	39.2	63.2	88.6	124.8	172.2	227.1	292.3
7	23.6	44.7	71.9	101.1	142.0	194.5	255.3	327.1
8	26.8	50.3	80.6	113.7	158.9	216.7	283.4	361.9
9	29.9	55.9	89.3	126.2	175.9	239.0	311.6	396.6
10	33.0	61.4	98.0	138.7	193.0	261.2	339.7	431.4
12	39.3	72.5	115.4	163.7	227.0	305.7	367.9	501.0

WEIGHT OF TWO (2) RIVET HEADS IN POUNDS.

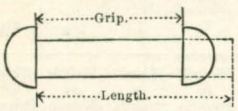
	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4
Before driving..	.037	.116	.222	.273	.453	.78	1.16	1.67
After driving....	.032	.082	.147	.246	.369	.545	.746	1.02

WEIGHT OF BODY PER INCH OF LENGTH IN POUNDS.

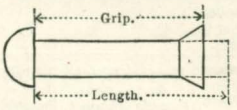
	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4
Before driving..	.031	.056	.087	.125	.170	.223	.282	.348

TABLE SHOWING LENGTH OF RIVET-SHANK REQUIRED TO FORM HEAD.

PLAIN RIVETS.



COUNTERSUNK RIVETS.



Grip in Inches.	Diameter in Inches.					Grip in Inches.	Diameter in Inches.					Grip in Inches.
	½	⅝	¾	⅞	1		½	⅝	¾	⅞	1	
	Length in Inches.						Length in Inches.					
½	1 5/16	1 7/8	2	2 1/16	2 1/4	½	1 1/4	1 3/8	1 3/8	1 1/2	1 1/2	½
9/16	1 3/4	2	2 1/16	2 1/4	2 3/8	9/16	1 3/8	1 1/2	1 1/2	1 5/8	1 5/8	9/16
⅝	1 7/8	2 1/16	2 1/4	2 3/8	2 1/2	⅝	1 1/2	1 5/8	1 5/8	1 3/4	1 3/4	⅝
11/16	2	2 1/4	2 3/8	2 1/2	2 5/8	11/16	1 5/8	1 3/4	1 3/4	1 7/8	1 7/8	11/16
¾	2 1/16	2 3/8	2 5/8	2 3/4	2 7/8	¾	1 3/4	1 7/8	1 7/8	2	2	¾
13/16	2 1/4	2 5/8	2 3/4	2 7/8	3	13/16	1 7/8	2	2	2 1/16	2 1/16	13/16
⅞	2 3/8	2 3/4	2 7/8	3	3 1/16	⅞	2	2 1/16	2 1/16	2 1/4	2 1/4	⅞
15/16	2 1/2	2 3/4	2 7/8	3	3 1/16	15/16	2 1/16	2 1/4	2 1/4	2 3/8	2 3/8	15/16
1	2 5/8	3	3 1/16	3 1/4	3 3/8	1	2 1/4	2 3/8	2 1/2	2 1/2	2 5/8	1
1 1/16	2 7/8	3 1/16	3 1/4	3 3/8	3 1/2	1 1/16	2 3/8	2 1/2	2 5/8	2 5/8	2 3/4	1 1/16
1 1/8	3	3 1/4	3 3/8	3 1/2	3 5/8	1 1/8	2 1/2	2 5/8	2 3/4	2 3/4	2 7/8	1 1/8
1 3/16	3 1/16	3 3/8	3 1/2	3 5/8	3 3/4	1 3/16	2 5/8	2 3/4	2 7/8	2 7/8	3	1 3/16
2	3 1/4	3 1/2	3 5/8	3 3/4	3 7/8	2	2 3/4	2 7/8	3	3	3 1/16	2
2 1/16	3 3/8	3 5/8	3 3/4	3 7/8	4	2 1/16	2 7/8	3	3 1/16	3 1/16	3 1/4	2 1/16
2 1/8	3 1/2	3 3/4	3 7/8	4	4 1/16	2 1/8	3	3 1/16	3 1/4	3 1/4	3 3/8	2 1/8
2 3/16	3 5/8	3 7/8	4	4 1/16	4 1/4	2 3/16	3 1/16	3 1/4	3 3/8	3 3/8	3 1/2	2 3/16
2 1/4	3 3/4	4	4 1/16	4 1/4	4 3/8	2 1/4	3 1/4	3 3/8	3 1/2	3 1/2	3 5/8	2 1/4
2 5/16	3 7/8	4 1/16	4 1/4	4 3/8	4 1/2	2 5/16	3 3/8	3 1/2	3 5/8	3 5/8	3 3/4	2 5/16
2 3/8	4	4 1/4	4 3/8	4 1/2	4 5/8	2 3/8	3 1/2	3 5/8	3 3/4	3 3/4	3 7/8	2 3/8
2 7/16	4 1/16	4 3/8	4 1/2	4 5/8	4 3/4	2 7/16	3 5/8	3 3/4	3 7/8	3 7/8	4	2 7/16
3	4 3/16	4 5/16	4 3/4	4 7/8	5	3	3 7/8	3 7/8	4	4 1/16	4 1/4	3
3 1/16	4 1/2	4 3/4	4 7/8	5	5 1/16	3 1/16	4	4 1/16	4 1/16	4 1/4	4 3/8	3 1/16
3 1/8	4 5/16	4 7/8	5	5 1/16	5 1/4	3 1/8	4 1/16	4 1/4	4 1/4	4 3/8	4 1/2	3 1/8
3 3/16	4 3/4	5	5 1/16	5 1/4	5 3/8	3 3/16	4 1/4	4 3/8	4 3/8	4 1/2	4 5/8	3 3/16
3 1/4	4 7/8	5 1/16	5 1/4	5 3/8	5 1/2	3 1/4	4 3/8	4 1/2	4 1/2	4 5/8	4 3/4	3 1/4
3 5/16	5	5 1/4	5 3/8	5 1/2	5 5/8	3 5/16	4 1/2	4 5/8	4 5/8	4 3/4	4 7/8	3 5/16
3 3/8	5 1/16	5 3/8	5 1/2	5 5/8	5 3/4	3 3/8	4 5/8	4 3/4	4 3/4	4 7/8	5	3 3/8
3 7/16	5 1/4	5 1/2	5 5/8	5 3/4	5 7/8	3 7/16	4 3/4	4 7/8	4 7/8	5	5 1/16	3 7/16
4	5 3/8	5 5/8	5 3/4	5 7/8	6	4	4 7/8	5	5 1/16	5 1/16	5 1/4	4
4 1/16	5 1/2	5 3/4	5 7/8	6	6 1/16	4 1/16	5	5 1/16	5 1/4	5 1/4	5 3/8	4 1/16
4 1/8	5 5/8	5 7/8	6	6 1/16	6 1/4	4 1/8	5 1/16	5 1/4	5 3/8	5 3/8	5 1/2	4 1/8
4 3/16	5 3/4	6	6 1/16	6 1/4	6 3/8	4 3/16	5 1/4	5 3/8	5 1/2	5 1/2	5 5/8	4 3/16
4 1/4	6	6 1/4	6 3/8	6 5/8	6 5/8	4 1/4				5 5/8	5 3/4	4 1/4
4 5/16	6 1/16	6 3/8	6 1/2	6 5/8	6 3/4	4 5/16				5 3/4	5 7/8	4 5/16
4 3/8	6 1/4	6 1/2	6 5/8	6 3/4	6 7/8	4 3/8				5 7/8	6	4 3/8
4 7/16	6 3/8	6 5/8	6 3/4	6 7/8	7	4 7/16				6	6 1/16	4 7/16
5	6 1/2	6 3/4	6 7/8	7	7 1/16	5				6 1/16	6 1/4	5
5 1/16	6 5/8	6 7/8	7	7 1/16	7 1/4	5 1/16				6 1/4	6 3/8	5 1/16
5 1/4	6 3/4	7	7 1/16	7 1/4	7 3/8	5 1/4				6 3/8	6 1/2	5 1/4

For weight of rivets, see page 43.

WEIGHTS OF BOLTS PER HUNDRED.

SQUARE HEADS AND NUTS.

Dimensions in Inches.

Diameter.	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2
Length.	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*
1 1/2	9.7	20.4	37.0	58.0						
1 3/4	10.5	21.3	37.9	60.8						
2	11.3	22.4	39.9	63.2	97.7	145				
2 1/4	12.1	23.6	42.0	66.0	101.6	149				
2 1/2	12.9	25.0	44.4	69.0	105.6	153				
2 3/4	13.7	26.4	46.2	72.1	109.7	158				
3	14.5	27.8	48.3	75.2	113.8	163	240	309	350	480
3 1/2	16.1	30.6	52.5	81.4	122.0	174	253	325	370	500
4	17.7	33.4	56.7	87.6	130.2	185	267	342	390	520
4 1/2	19.2	36.2	60.9	93.8	138.4	196	281	359	410	545
5	20.7	39.0	65.1	100.0	146.4	207	295	376	430	570
5 1/2	22.2	41.8	69.2	106.1	154.9	218	309	394	450	595
6	23.7	44.6	73.4	112.2	163.2	229	323	412	470	620
6 1/2	25.2	47.4	77.6	118.3	171.5	240	337	430	490	645
7	26.7	50.2	81.8	124.4	179.8	251	351	448	510	670
7 1/2	28.2	53.1	86.0	130.5	187.1	262	365	466	530	695
8	29.7	56.0	90.0	136.6	195.4	273	379	484	550	725
9	33.1	61.5	98.0	148.8	212.0	295	407	518	590	775
10	36.5	67.0	106.3	161.0	229.0	317	435	552	630	825
11	40.0	72.5	114.6	173.2	246.0	339	463	586	670	875
12	43.5	78.0	122.9	184.4	263.0	361	491	620	710	925
Additional per Inch. Increase in Length	3.1	5.5	8.7	12.5	17.0	22.2	28.1	34.8	42.0	50.0
	Amount to be deducted from weights in table if Hexagon Heads and Nuts are used.									
	1.2	3.6	5.3	12.0	15.0	21.0	31.0	42.0	50.0	64.0

WEIGHT OF FLAT BARS.

POUNDS PER LINEAL FOOT.

Width in Inches.	*Thickness in Fractions of an Inch.*									
	1/16	1/8	3/16	1/4	5/16	3/8	7/16	1/2	5/8	3/4
1	.212	.425	.637	.850	1.06	1.28	1.49	1.70	2.12	2.55
1 1/8	.239	.478	.717	.956	1.20	1.43	1.67	1.91	2.39	2.87
1 1/4	.266	.531	.797	1.06	1.33	1.59	1.86	2.12	2.66	3.19
1 3/8	.292	.584	.877	1.17	1.46	1.75	2.05	2.34	2.92	3.51
1 1/2	.319	.638	.956	1.28	1.59	1.91	2.23	2.55	3.19	3.83
1 5/8	.345	.691	1.04	1.38	1.73	2.07	2.42	2.76	3.45	4.14
1 3/4	.372	.744	1.12	1.49	1.86	2.23	2.60	2.98	3.72	4.46
1 7/8	.399	.797	1.20	1.59	1.99	2.39	2.79	3.19	3.99	4.78
2	.425	.850	1.28	1.70	2.12	2.55	2.98	3.40	4.25	5.10
2 1/8	.452	.903	1.35	1.81	2.26	2.71	3.16	3.61	4.52	5.42
2 1/4	.478	.956	1.43	1.91	2.39	2.87	3.35	3.83	4.78	5.74
2 3/8	.505	1.01	1.51	2.02	2.52	3.03	3.53	4.04	5.05	6.06
2 1/2	.531	1.06	1.59	2.12	2.66	3.19	3.72	4.25	5.31	6.38
2 5/8	.558	1.11	1.67	2.23	2.79	3.35	3.91	4.46	5.58	6.69
2 3/4	.584	1.17	1.75	2.34	2.92	3.51	4.09	4.68	5.84	7.01
2 7/8	.611	1.22	1.83	2.44	3.06	3.67	4.28	4.89	6.11	7.33
3	.638	1.28	1.91	2.55	3.19	3.83	4.46	5.10	6.38	7.65
3 1/4	.691	1.38	2.07	2.76	3.45	4.14	4.83	5.53	6.91	8.29
3 1/2	.744	1.49	2.23	2.98	3.72	4.46	5.21	5.95	7.44	8.93
3 3/4	.797	1.59	2.39	3.19	3.99	4.78	5.58	6.38	7.97	9.56
4	.850	1.70	2.55	3.40	4.25	5.10	5.95	6.80	8.50	10.20
4 1/4	.903	1.81	2.71	3.61	4.52	5.42	6.32	7.23	9.03	10.84
4 1/2	.956	1.91	2.87	3.83	4.78	5.74	6.69	7.65	9.56	11.48
4 3/4	1.01	2.02	3.03	4.04	5.05	6.06	7.07	8.08	10.09	12.11
5	1.06	2.12	3.19	4.25	5.31	6.38	7.44	8.50	10.63	12.75
5 1/4	1.12	2.23	3.35	4.46	5.58	6.69	7.81	8.93	11.16	13.39
5 1/2	1.17	2.34	3.51	4.67	5.84	7.01	8.18	9.35	11.69	14.03
5 3/4	1.22	2.44	3.67	4.89	6.11	7.33	8.55	9.78	12.22	14.67
6	1.28	2.55	3.83	5.10	6.38	7.65	8.93	10.20	12.75	15.30
6 1/4	1.33	2.66	3.98	5.31	6.64	7.97	9.30	10.63	13.28	15.94
6 1/2	1.38	2.76	4.14	5.53	6.91	8.29	9.67	11.05	13.81	16.58
6 3/4	1.43	2.87	4.30	5.74	7.17	8.61	10.04	11.48	14.34	17.21
7	1.49	2.98	4.46	5.95	7.44	8.93	10.41	11.90	14.87	17.85
7 1/4	1.54	3.08	4.62	6.16	7.70	9.24	10.78	12.32	15.41	18.49
7 1/2	1.59	3.19	4.78	6.38	7.97	9.57	11.16	12.75	15.94	19.13
7 3/4	1.65	3.29	4.94	6.59	8.24	9.88	11.53	13.18	16.47	19.76
8	1.70	3.40	5.10	6.80	8.50	10.20	11.90	13.60	17.00	20.40
8 1/2	1.81	3.61	5.42	7.22	9.03	10.84	12.64	14.45	18.06	21.68
9	1.91	3.83	5.74	7.65	9.56	11.48	13.39	15.30	19.13	22.95
9 1/2	2.02	4.04	6.06	8.08	10.10	12.12	14.13	16.15	20.19	24.23
10	2.13	4.25	6.38	8.50	10.63	12.75	14.88	17.00	21.25	25.50
10 1/2	2.23	4.46	6.69	8.92	11.16	13.39	15.62	17.85	22.31	26.78
11	2.34	4.67	7.01	9.35	11.69	14.03	16 36	18.70	23.38	28.05
11 1/2	2.44	4.89	7.33	9.78	12.22	14.68	17.11	19.55	24.44	29.33
12	2.55	5.10	7.65	10.20	12.75	15.30	17.85	20.40	25.50	30.60

WEIGHT OF FLAT BARS.

POUNDS PER LINEAL FOOT.

Thickness in Fractions of Inches.										Width in Inches.
7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4	1 7/8	2	
2.98	3.40	3.83	4.25	4.68	5.10	5.52	5.95	6.38	6.80	1
3.35	3.83	4.30	4.78	5.26	5.74	6.22	6.69	7.17	7.65	1 1/8
3.72	4.25	4.78	5.31	5.84	6.37	6.91	7.44	7.97	8.50	1 1/4
4.09	4.67	5.26	5.84	6.43	7.01	7.60	8.18	8.77	9.35	1 3/8
4.46	5.10	5.74	6.38	7.01	7.65	8.29	8.93	9.56	10.20	1 1/2
4.83	5.53	6.22	6.91	7.60	8.29	8.98	9.67	10.36	11.05	1 5/8
5.21	5.95	6.69	7.44	8.18	8.93	9.67	10.41	11.16	11.90	1 3/4
5.58	6.38	7.17	7.97	8.77	9.56	10.36	11.16	11.95	12.75	1 7/8
5.95	6.80	7.65	8.50	9.35	10.20	11.05	11.90	12.75	13.60	2
6.32	7.23	8.13	9.03	9.94	10.84	11.74	12.64	13.55	14.45	2 1/8
6.69	7.65	8.61	9.56	10.52	11.48	12.43	13.39	14.34	15.30	2 1/4
7.07	8.08	9.09	10.10	11.10	12.11	13.12	14.13	15.14	16.15	2 3/8
7.44	8.50	9.56	10.62	11.69	12.75	13.81	14.88	15.94	17.00	2 1/2
7.81	8.93	10.04	11.16	12.27	13.39	14.50	15.62	16.74	17.85	2 5/8
8.18	9.35	10.52	11.69	12.86	14.03	15.19	16.36	17.53	18.70	2 3/4
8.55	9.77	11.00	12.22	13.44	14.66	15.88	17.11	18.33	19.55	2 7/8
8.93	10.20	11.48	12.75	14.03	15.30	16.57	17.85	19.13	20.40	3
9.67	11.05	12.43	13.81	15.20	16.58	17.96	19.34	20.72	22.10	3 1/4
10.41	11.90	13.39	14.88	16.36	17.85	19.34	20.83	22.31	23.80	3 1/2
11.16	12.75	14.34	15.94	17.53	19.13	20.72	22.32	23.91	25.50	3 3/4
11.90	13.60	15.30	17.00	18.70	20.40	22.10	23.80	25.50	27.20	4
12.64	14.45	16.26	18.06	19.87	21.67	23.48	25.29	27.09	28.90	4 1/4
13.39	15.30	17.21	19.13	21.04	22.95	24.86	26.78	28.69	30.60	4 1/2
14.13	16.15	18.17	20.19	22.21	24.23	26.24	28.26	30.28	32.30	4 3/4
14.87	17.00	19.12	21.25	23.38	25.50	27.62	29.75	31.87	34.00	5
15.62	17.85	20.08	22.31	24.54	26.78	29.01	31.24	33.47	35.70	5 1/4
16.36	18.70	21.04	23.38	25.71	28.05	30.39	32.72	35.06	37.40	5 1/2
17.11	19.55	21.99	24.44	26.88	29.33	31.77	34.21	36.66	39.10	5 3/4
17.85	20.40	22.95	25.50	28.05	30.60	33.15	35.70	38.25	40.80	6
18.60	21.25	23.91	26.56	29.22	31.88	34.53	37.19	39.84	42.50	6 1/4
19.34	22.10	24.86	27.62	30.39	33.15	35.91	38.68	41.44	44.20	6 1/2
20.08	22.95	25.82	28.69	31.56	34.43	37.29	40.16	43.03	45.90	6 3/4
20.83	23.80	26.78	29.75	32.73	35.70	38.68	41.65	44.62	47.60	7
21.57	24.65	27.73	30.81	33.89	36.98	40.06	43.14	46.22	49.30	7 1/4
22.31	25.50	28.69	31.88	35.06	38.25	41.44	44.63	47.81	51.00	7 1/2
23.06	26.35	29.64	32.94	36.23	39.52	42.82	46.11	49.40	52.70	7 3/4
23.80	27.20	30.60	34.00	37.40	40.80	44.20	47.60	51.00	54.40	8
25.29	28.90	32.51	36.12	39.74	43.35	46.96	50.58	54.18	57.80	8 1/2
26.78	30.60	34.42	38.25	42.08	45.90	49.72	53.55	57.37	61.20	9
28.26	32.30	36.34	40.37	44.41	48.45	52.49	56.53	60.56	64.60	9 1/2
29.75	34.00	38.25	42.50	46.75	51.00	55.25	59.50	63.75	68.00	10
31.24	35.70	40.17	44.63	49.09	53.55	58.02	62.48	66.94	71.40	10 1/2
32.72	37.40	42.08	46.75	51.42	56.10	60.78	65.45	70.12	74.80	11
34.22	39.10	43.99	48.88	53.76	58.65	63.54	68.43	73.32	78.20	11 1/2
35.70	40.80	45.90	51.00	56.10	61.20	66.30	71.40	76.50	81.60	12

WEIGHT OF SQUARE AND ROUND BARS.

POUNDS PER LINEAL FOOT.

Thickness or Diam. Inches.	■	●	Area of ○ Bar in Sq. Inches.	Thickness or Diam. Inches.	■	●	Area of ○ Bar in Sq. Inches.
1/16	.013	.010	.0031	13/16	26.90	21.12	6.213
1/8	.053	.042	.0123	7/8	28.10	22.07	6.492
3/16	.119	.094	.0276	15/16	29.33	23.04	6.777
1/4	.212	.167	.0491	3	30.60	24.01	7.069
5/16	.332	.261	.0767	1/16	31.88	25.04	7.366
3/8	.478	.375	.1104	1/8	33.20	26.08	7.670
7/16	.651	.511	.1503	3/16	34.55	27.13	7.980
1/2	.850	.667	.1963	1/4	35.91	28.20	8.296
9/16	1.076	.844	.2485	5/16	37.31	29.30	8.618
5/8	1.328	1.043	.3067	3/8	38.73	30.41	8.946
11/16	1.607	1.261	.3712	7/16	40.18	31.55	9.281
3/4	1.912	1.502	.4417	1/2	41.65	32.71	9.621
13/16	2.245	1.762	.5184	9/16	43.15	33.89	9.968
7/8	2.603	2.044	.6013	5/8	44.68	35.09	10.321
15/16	2.989	2.347	.6902	11/16	46.24	36.31	10.680
1	3.400	2.670	.7854	3/4	47.82	37.55	11.045
1/16	3.838	3.014	.8866	13/16	49.42	38.81	11.416
1/8	4.303	3.379	.9940	7/8	51.05	40.10	11.793
3/16	4.795	3.766	1.1075	15/16	52.71	41.40	12.177
1/4	5.312	4.173	1.2272	4	54.39	42.72	12.566
5/16	5.857	4.600	1.3530	1/8	57.85	45.44	13.364
3/8	6.428	5.049	1.4849	1/4	61.41	48.23	14.186
7/16	7.026	5.518	1.6230	3/8	65.08	51.11	15.033
1/2	7.650	6.008	1.7671	1/2	68.85	54.07	15.904
9/16	8.301	6.520	1.9175	5/8	72.72	57.12	16.800
5/8	8.978	7.051	2.0739	3/4	76.71	60.25	17.721
11/16	9.682	7.604	2.2365	7/8	80.80	63.46	18.665
3/4	10.41	8.178	2.4053	5	85.00	66.76	19.635
13/16	11.17	8.773	2.5802	1/8	89.30	70.13	20.629
7/8	11.95	9.388	2.7612	1/4	93.72	73.60	21.648
15/16	12.76	10.024	2.9483	3/8	98.22	77.15	22.691
2	13.60	10.68	3.1416	1/2	102.81	80.77	23.758
1/16	14.46	11.36	3.3410	5/8	107.6	84.48	24.850
1/8	15.35	12.06	3.5466	3/4	112.4	88.29	25.967
3/16	16.27	12.78	3.7583	7/8	117.4	92.16	27.109
1/4	17.22	13.51	3.9761	6	122.4	96.13	28.274
5/16	18.19	14.28	4.2000	1/8	127.6	100.18	29.465
3/8	19.18	15.06	4.4301	1/4	132.8	104.34	30.680
7/16	20.20	15.86	4.6664	3/8	138.2	108.53	31.919
1/2	21.25	16.69	4.9087	1/2	143.65	112.81	33.183
9/16	22.33	17.53	5.1572	5/8	149.23	117.20	34.472
5/8	23.43	18.40	5.4119	3/4	154.93	121.68	35.785
11/16	24.56	19.29	5.6727	7/8	160.75	126.17	37.122
3/4	25.71	20.20	5.9396	7	166.56	130.86	38.485

DECIMAL EQUIVALENTS FOR VULGAR FRACTIONS.

The given decimals are the parts of inches corresponding to fraction of inches in first column; also, the parts of feet for the fraction of inches in third column.

	.0052	1/16		.2552	3 1/16		.5052	6 1/16		.7552	9 1/16
	.0104	1/8		.2604	3 1/8		.5104	6 1/8		.7604	9 1/8
1/64	.015625	3/16	17/64	.265625	3 3/16	33/64	.515625	6 3/16	49/64	.765625	9 3/16
	.0208	1/4		.2708	3 1/4		.5208	6 1/4		.7708	9 1/4
	.0260	5/16		.2760	3 5/16		.5260	6 5/16		.7760	9 5/16
1/32	.03125	3/8	9/32	.28125	3 3/8	17/32	.53125	6 3/8	25/32	.78125	9 3/8
	.0364	7/16		.2865	3 7/16		.5364	6 7/16		.7865	9 7/16
	.0417	1/2		.2917	3 1/2		.5417	6 1/2		.7917	9 1/2
3/64	.046875	9/16	19/64	.296875	3 9/16	35/64	.546875	6 9/16	51/64	.796875	9 9/16
	.0521	5/8		.3021	3 5/8		.5521	6 5/8		.8021	9 5/8
	.0573	11/16		.3073	3 11/16		.5573	6 11/16		.8073	9 11/16
1/16	.0625	3/4	5/16	.3125	3 3/4	9/16	.5625	6 3/4	13/16	.8125	9 3/4
	.0677	13/16		.3177	3 13/16		.5677	6 13/16		.8177	9 13/16
	.0729	7/8		.3229	3 7/8		.5729	6 7/8		.8229	9 7/8
5/64	.078125	15/16	21/64	.328125	3 15/16	37/64	.578125	6 15/16	53/64	.828125	9 15/16
	.0833	1		.3333	4		.5833	7		.8333	10
	.0885	1 1/16		.3385	4 1/16		.5885	7 1/16		.8385	10 1/16
3/32	.09375	1 1/8	11/32	.34375	4 1/8	19/32	.59375	7 1/8	27/32	.84375	10 1/8
	.0990	1 3/16		.3490	4 3/16		.5990	7 3/16		.8490	10 3/16
	.1042	1 1/4		.3542	4 1/4		.6042	7 1/4		.8542	10 1/4
7/64	.109375	1 5/16	23/64	.359375	4 5/16	39/64	.609375	7 5/16	55/64	.859375	10 5/16
	.1146	1 3/8		.3646	4 3/8		.6146	7 3/8		.8646	10 3/8
	.1198	1 7/16		.3698	4 7/16		.6198	7 7/16		.8698	10 7/16
1/8	.1250	1 1/2	3/8	.3750	4 1/2	5/8	.6250	7 1/2	7/8	.8750	10 1/2
	.1302	1 9/16		.3802	4 9/16		.6302	7 9/16		.8802	10 9/16
	.1354	1 3/8		.3854	4 3/8		.6354	7 3/8		.8854	10 3/8
9/64	.140625	1 11/16	25/64	.390625	4 11/16	41/64	.640625	7 11/16	57/64	.890625	10 11/16
	.1458	1 3/4		.3958	4 3/4		.6458	7 3/4		.8958	10 3/4
	.1510	1 13/16		.4010	4 13/16		.6510	7 13/16		.9010	10 13/16
5/32	.15625	1 7/8	13/32	.40625	4 7/8	21/32	.65625	7 7/8	29/32	.90625	10 7/8
	.1615	1 15/16		.4114	4 15/16		.6615	7 15/16		.9115	10 15/16
	.1667	2		.4167	5		.6667	8		.9167	11
11/64	.171875	2 1/16	27/64	.421875	5 1/16	43/64	.671875	8 1/16	59/64	.921875	11 1/16
	.1771	2 1/8		.4271	5 1/8		.6771	8 1/8		.9271	11 1/8
	.1823	2 3/16		.4323	5 3/16		.6823	8 3/16		.9323	11 3/16
3/16	.1875	2 1/4	7/16	.4375	5 1/4	11/16	.6875	8 1/4	15/16	.9375	11 1/4
	.1927	2 5/16		.4427	5 5/16		.6927	8 5/16		.9427	11 5/16
	.1979	2 3/8		.4479	5 3/8		.6979	8 3/8		.9479	11 3/8
13/64	.203125	2 7/16	29/64	.453125	5 7/16	45/64	.703125	8 7/16	61/64	.953125	11 7/16
	.2083	2 1/2		.4583	5 1/2		.7083	8 1/2		.9583	11 1/2
	.2135	2 9/16		.4635	5 9/16		.7135	8 9/16		.9635	11 9/16
7/32	.21875	2 5/8	15/32	.46875	5 5/8	23/32	.71875	8 5/8	31/32	.96875	11 5/8
	.2240	2 11/16		.4740	5 11/16		.7240	8 11/16		.9740	11 11/16
	.2292	2 3/4		.4792	5 3/4		.7292	8 3/4		.9792	11 3/4
15/64	.234375	2 13/16	31/64	.484375	5 13/16	47/64	.734375	8 13/16	63/64	.984375	11 13/16
	.2395	2 7/8		.4896	5 7/8		.7396	8 7/8		.9896	11 7/8
	.2448	2 15/16		.4948	5 15/16		.7448	8 15/16		.9948	11 15/16
1/4	.2500	3	1/2	.5000	6	3/4	.7500	9	1	1.0000	12

PLATES

OF

PENCOYD

STEEL

SECTIONS.

The dimensions belong to the least sections. Several sections of beams and channels are rolled, which are not shown in lithographs. Some particulars of these will be found in the tables, or definite information will be furnished on application.

JULIUS BIEN & CO. N.Y.

All weights given in pounds per foot.

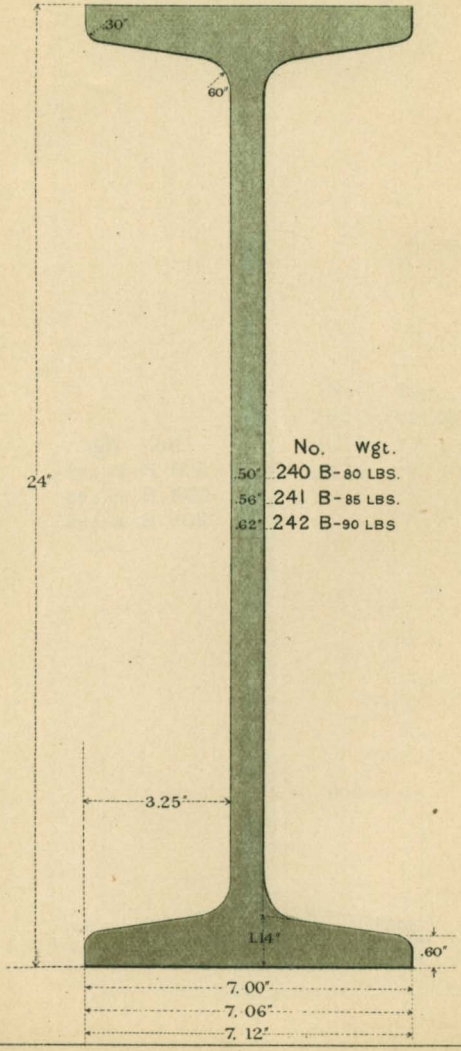
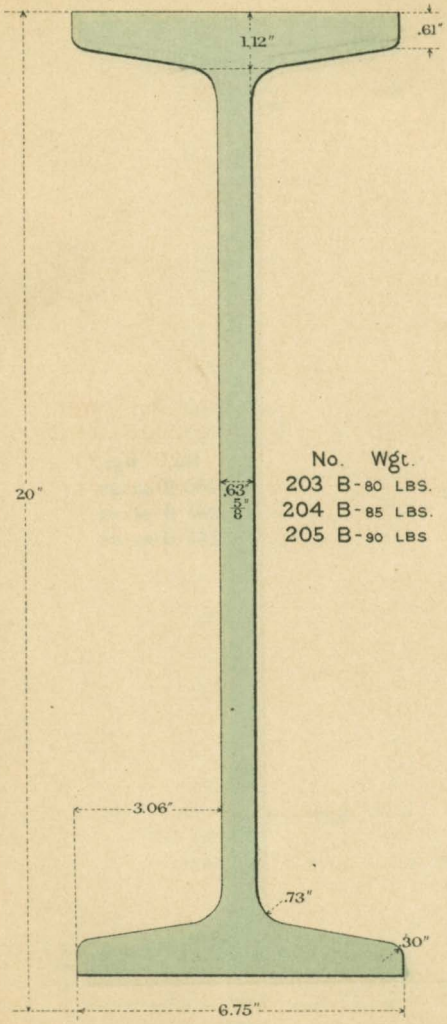
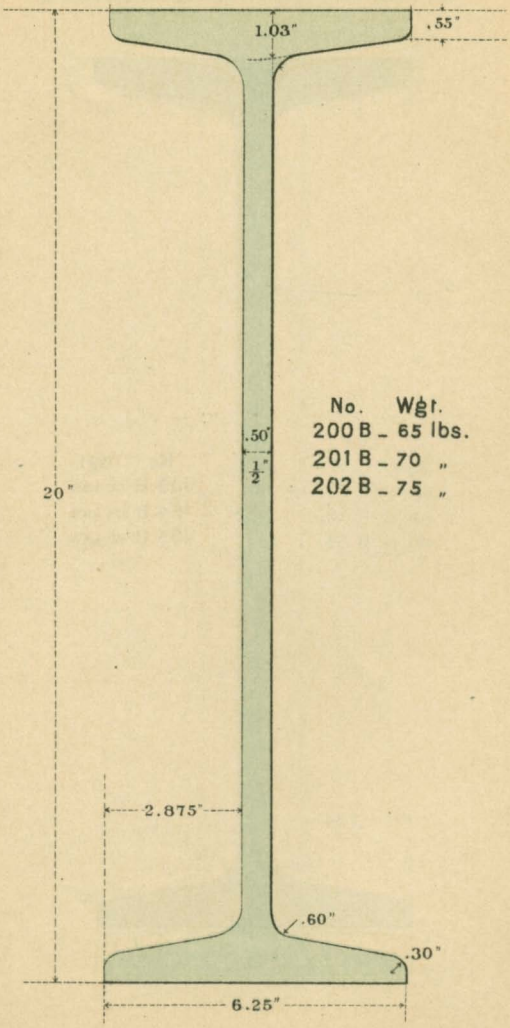


Plate No. 3.

All weights given in pounds per foot.



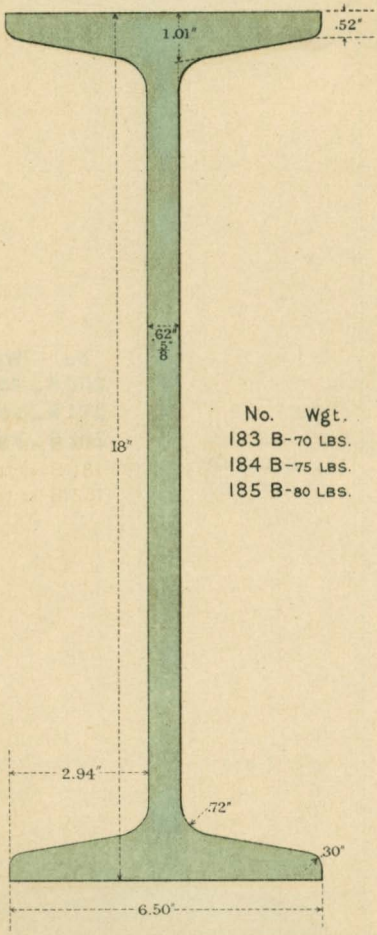
All weights given in pounds per foot.



No.	Wgt.
200 B	65 lbs.
201 B	70 "
202 B	75 "

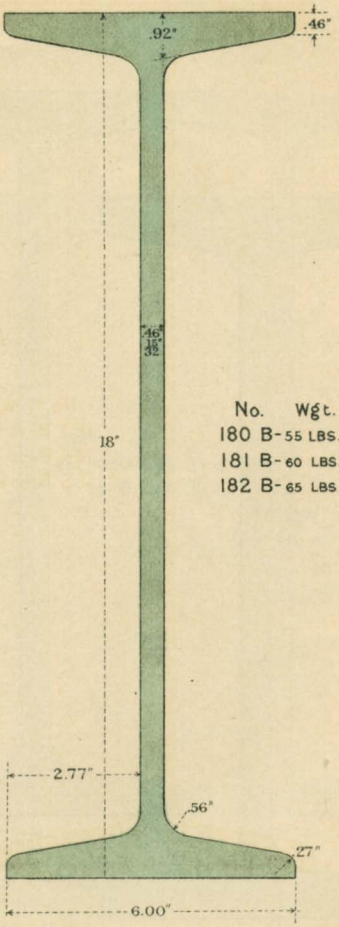
Plate No. 5.

All weights given in pounds per foot.

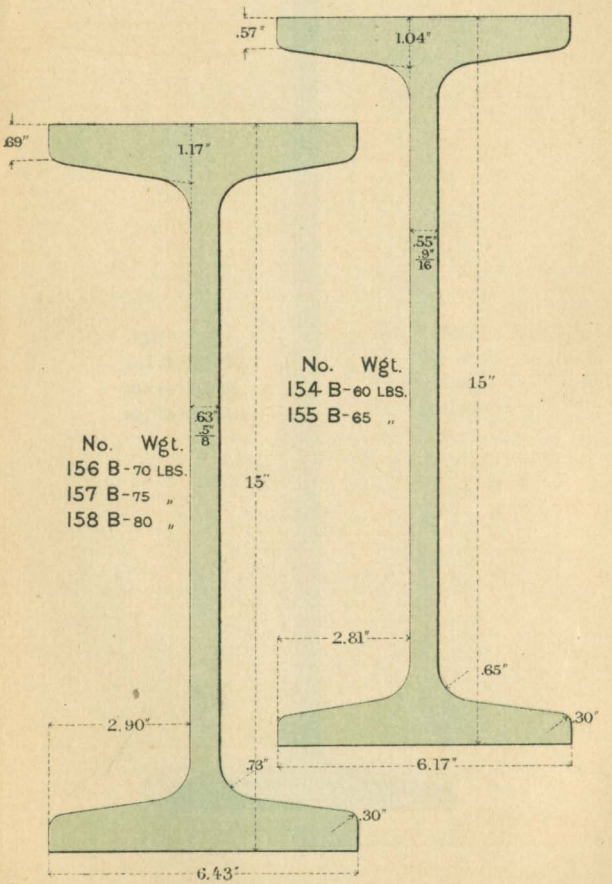


No.	Wgt.
183 B	70 LBS.
184 B	75 LBS.
185 B	80 LBS.

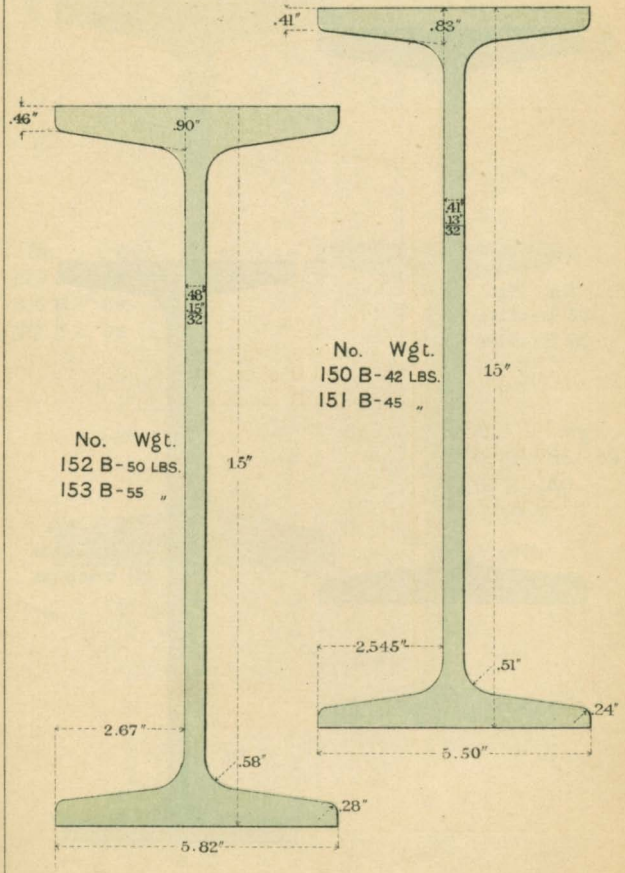
All weights given in pounds per foot



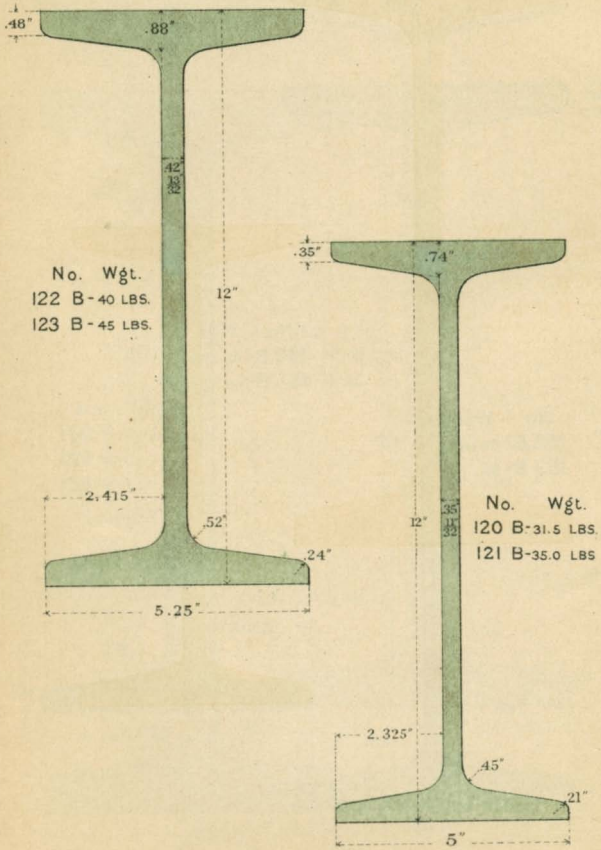
All weights given in pounds per foot



All weights given in pounds per foot



All weights given in pounds per foot.



All weights given in pounds per foot.

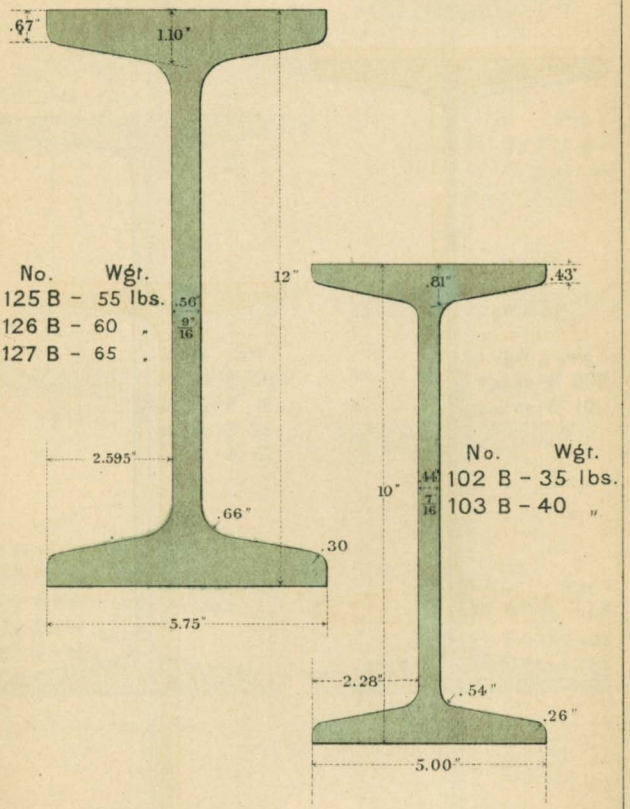
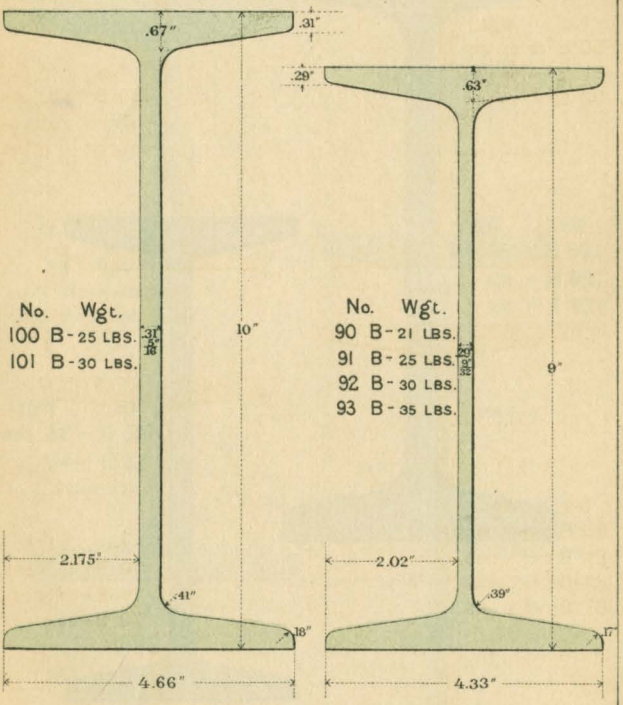
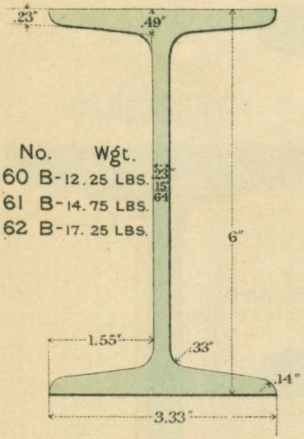


Plate No. II.

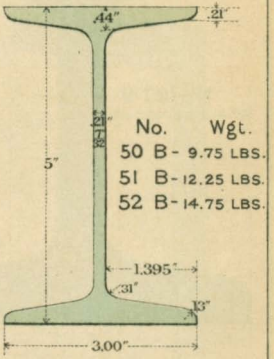
All weights given in pounds per foot.



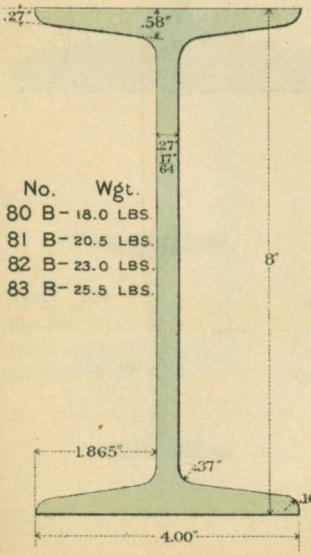
All weights given in pounds per foot



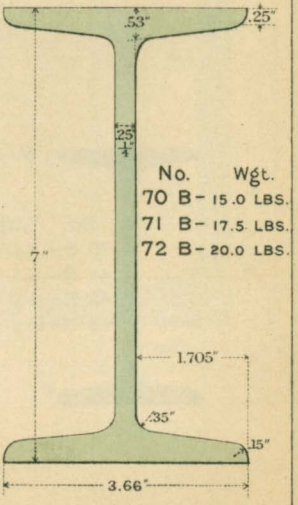
No. Wgt.
60 B-12.25 LBS.
61 B-14.75 LBS.
62 B-17.25 LBS.



No. Wgt.
50 B- 9.75 LBS.
51 B-12.25 LBS.
52 B-14.75 LBS.

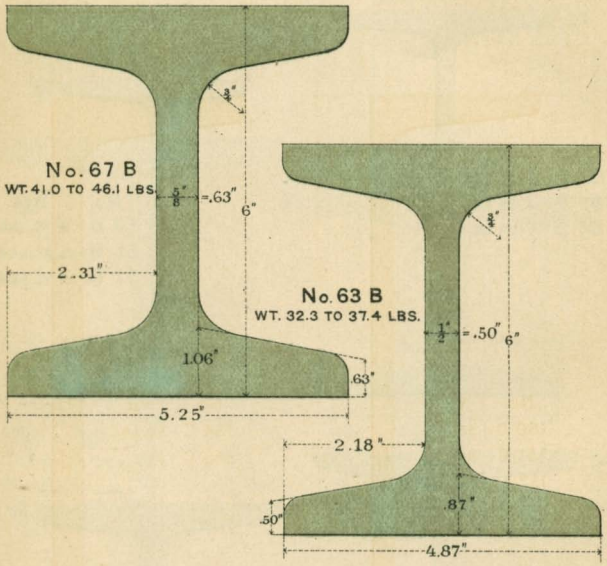


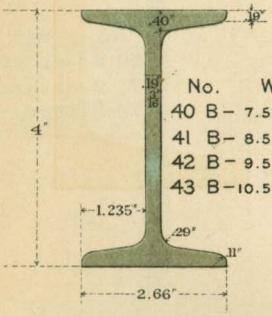
No. Wgt.
80 B- 18.0 LBS.
81 B- 20.5 LBS.
82 B- 23.0 LBS.
83 B- 25.5 LBS.

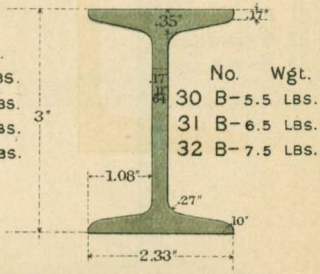


No. Wgt.
70 B- 15.0 LBS.
71 B- 17.5 LBS.
72 B- 20.0 LBS.

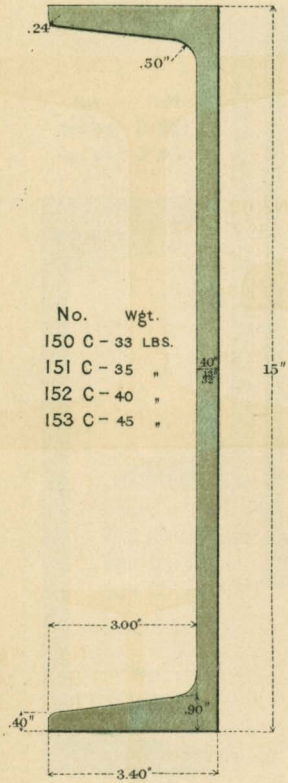
All weights given in pounds per foot.

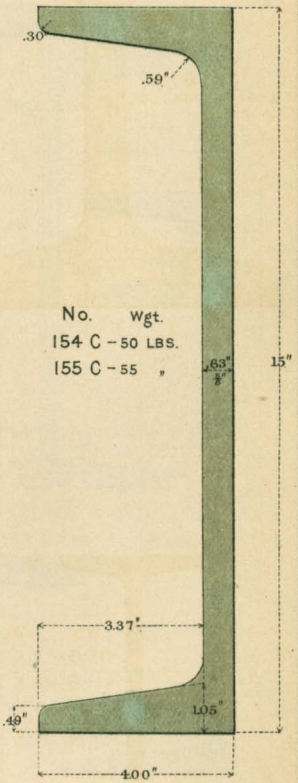






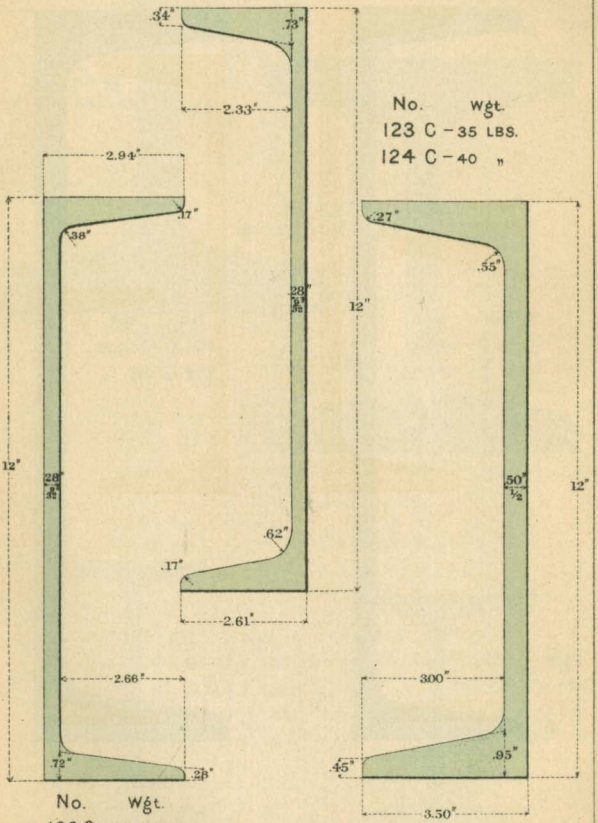
All weights given in pounds per foot.





All weights given in pounds per foot.

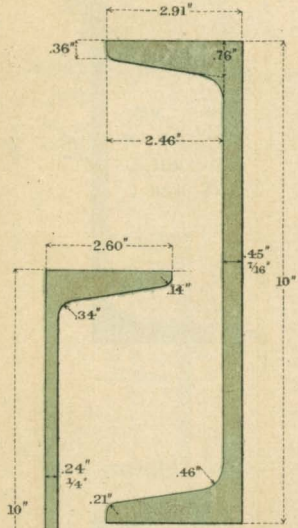
No. 128 C
WT. 20.5 TO 32.0 LBS.



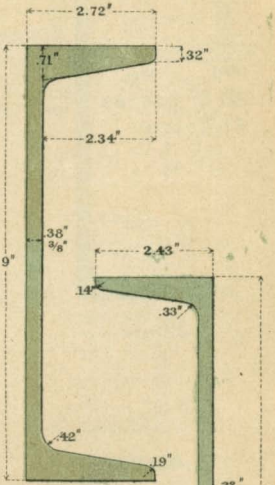
No. Wgt.
123 C – 35 LBS.
124 C – 40 „

No. Wgt.
120 C – 20.5 LBS.
121 C – 25.0 „
122 C – 30.0 „

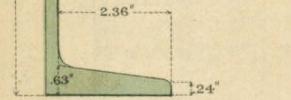
All weights given in pounds per foot.



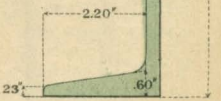
No.	Wgt.
102 C	25 LBS.
103 C	30 "
104 C	35 "



No.	Wgt.
92 C	20 LBS.
93 C	25 "



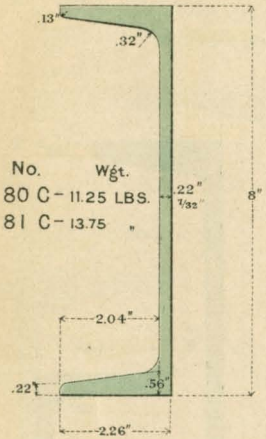
No.	Wgt.
100 C	15 LBS.
101 C	20 "

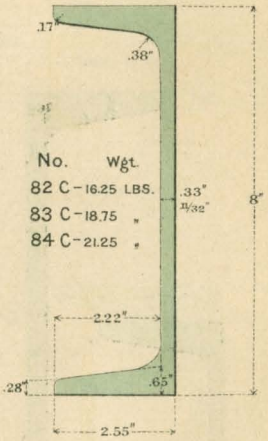


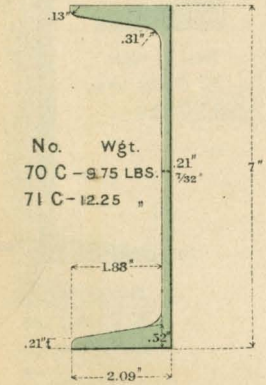
No.	Wgt.
90 C	13.25 LBS.
91 C	15.00 "

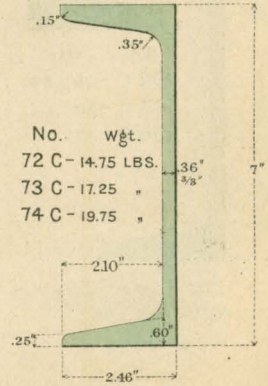
Plate No.17.

All weights given in pounds per foot.

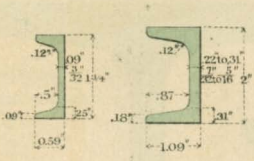






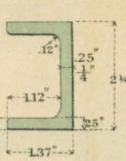


All weights given in pounds per foot.

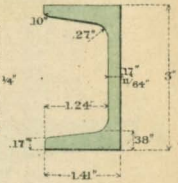


No. Wgt.
17 C-1.13

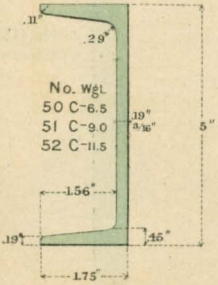
No. Wgt
20 C-2.9
21 C-3.6



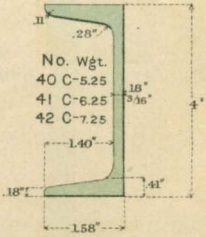
No. Wgt.
22 C-3.8



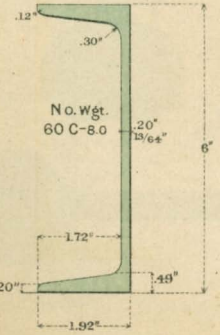
No. Wgt.
30 C-4.0
31 C-5.0
32 C-6.0



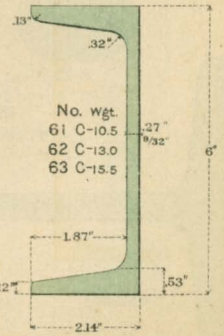
No. Wgt.
50 C-6.5
51 C-9.0
52 C-11.5



No. Wgt.
40 C-5.25
41 C-6.25
42 C-7.25



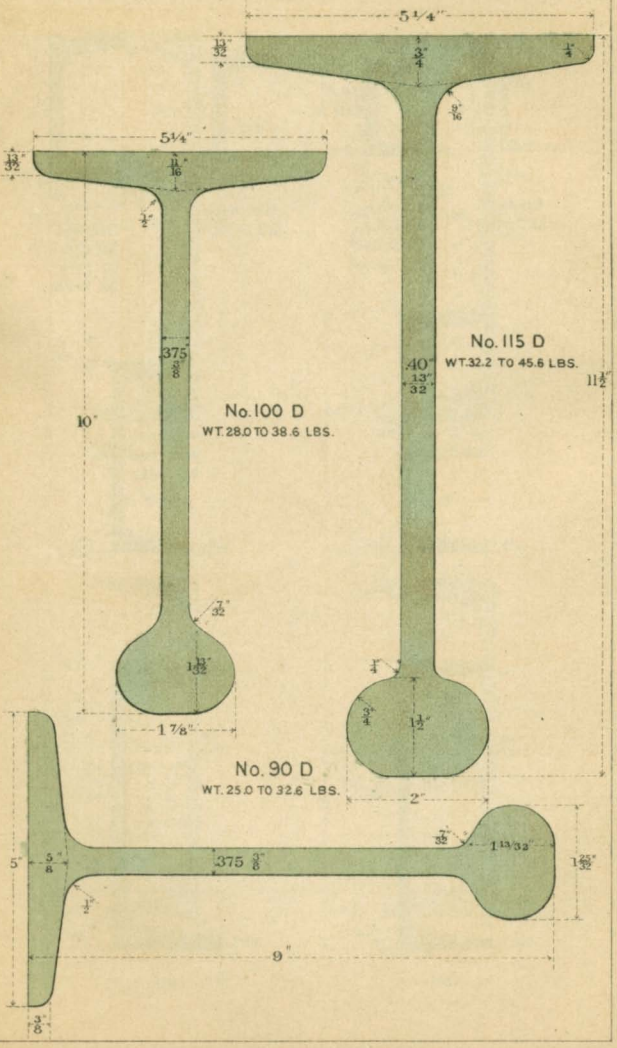
No. Wgt.
60 C-8.0



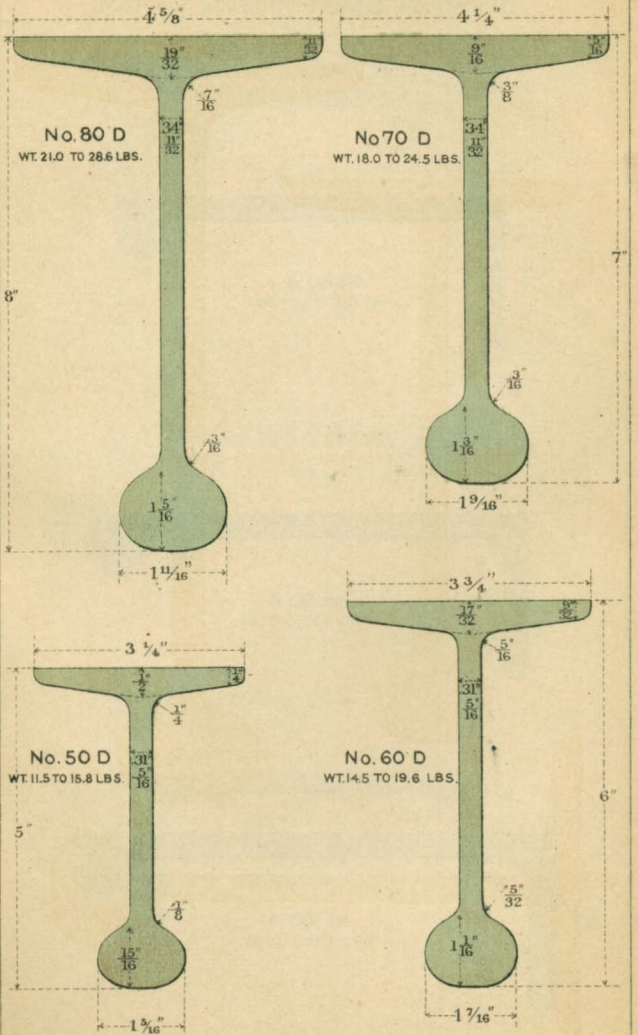
No. Wgt.
61 C-10.5
62 C-13.0
63 C-15.5

Plate No. 19.

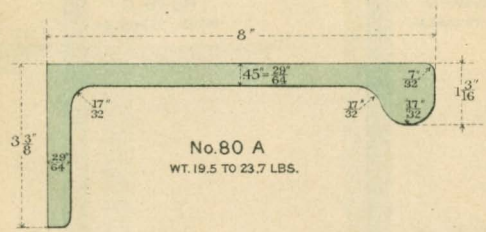
All weights given in pounds per foot.



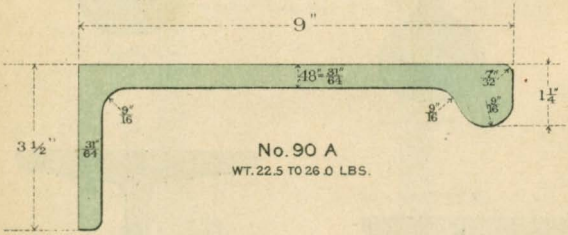
All weights given in pounds per foot.



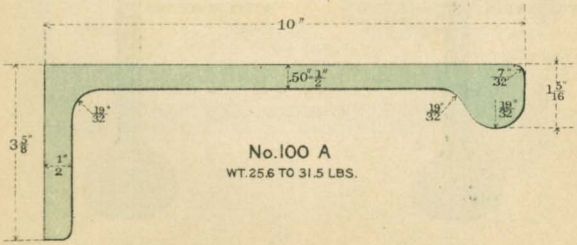
All weights given in pounds per foot.



No. 80 A
WT. 19.5 TO 23.7 LBS.

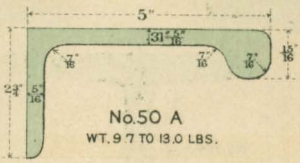


No. 90 A
WT. 22.5 TO 26.0 LBS.

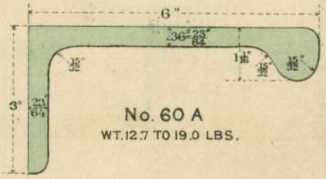


No. 100 A
WT. 25.6 TO 31.5 LBS.

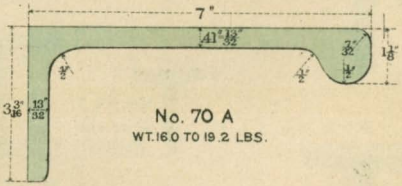
All weights given in pounds per foot.



No. 50 A
WT. 9.7 TO 13.0 LBS.



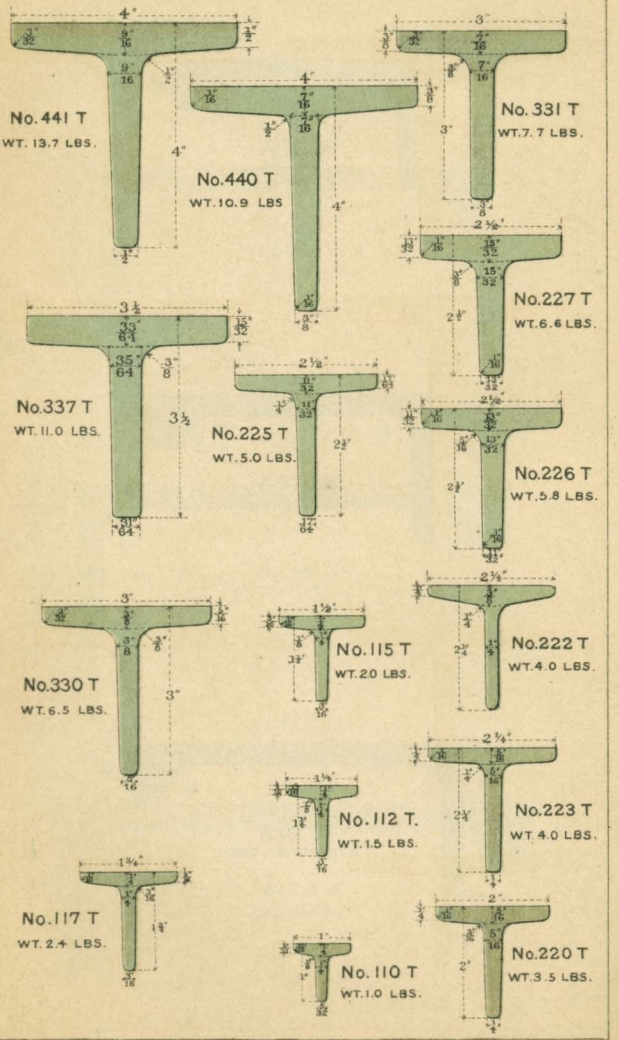
No. 60 A
WT. 12.7 TO 19.0 LBS.



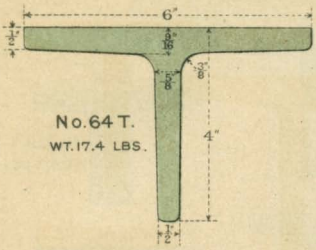
No. 70 A
WT. 16.0 TO 19.2 LBS.

Plate No. 23.

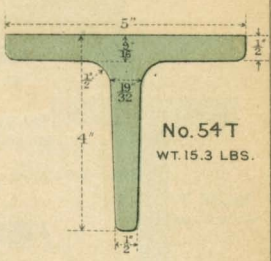
All weights given in pounds per foot



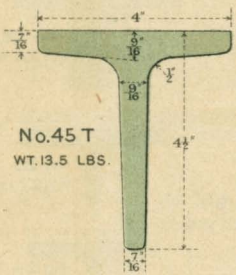
All weights given in pounds per foot.



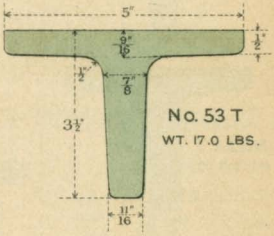
No.64 T.
WT. 17.4 LBS.



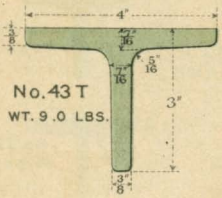
No.54 T
WT. 15.3 LBS.



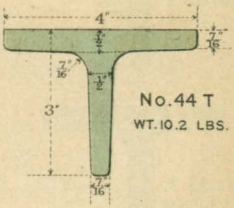
No.45 T
WT. 13.5 LBS.



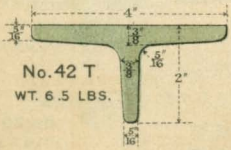
No. 53 T
WT. 17.0 LBS.



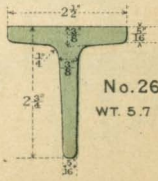
No.43 T
WT. 9.0 LBS.



No.44 T
WT. 10.2 LBS.

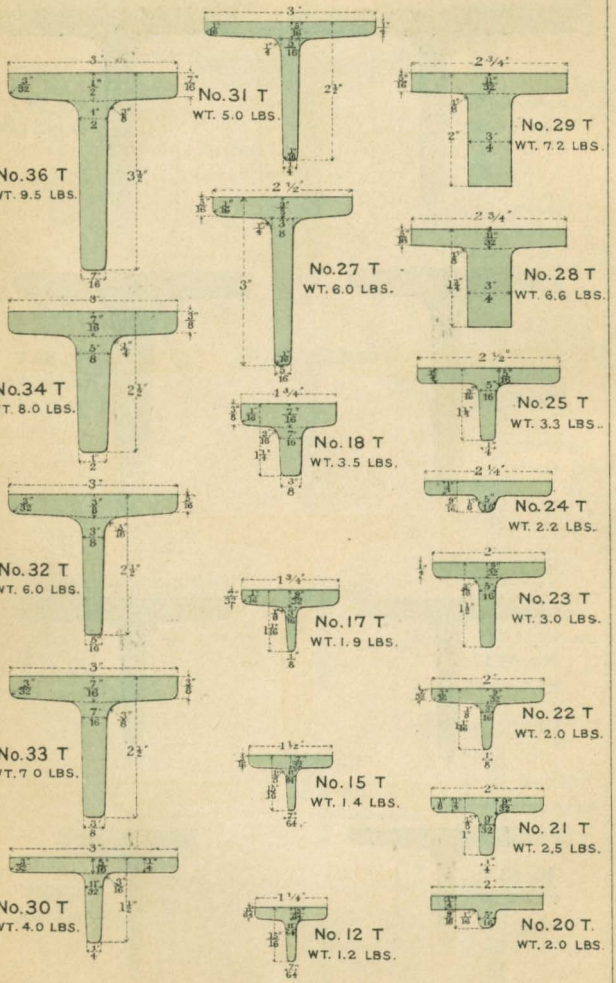


No.42 T
WT. 6.5 LBS.



No.26 T
WT. 5.7 LBS.

All weights given in pounds per foot. nt.



All weights given in pounds per foot.

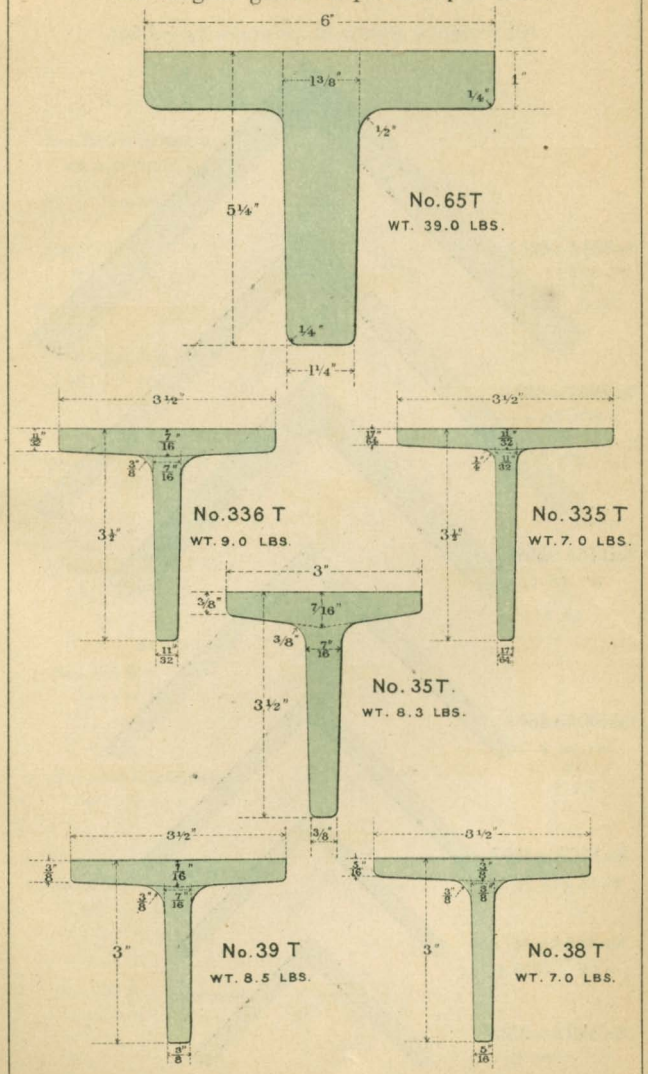
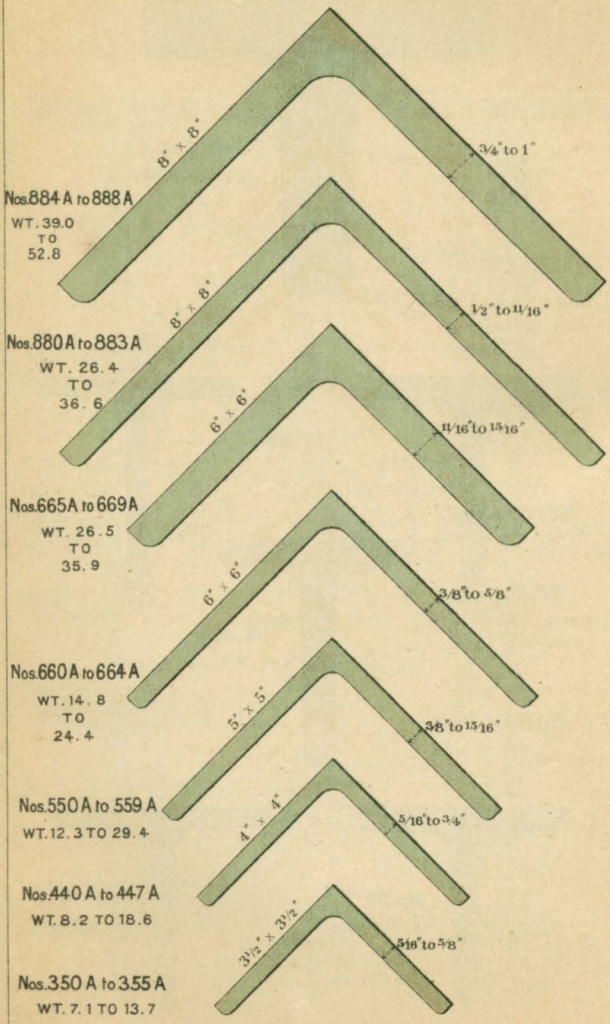


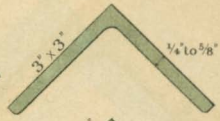
Plate No. 27.

All weights given in pounds per foot.



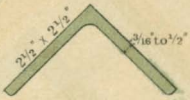
All weights given in pounds per foot.

Nos. 330 A to 336 A
WT. 4.9 TO 11.5



Nos. 275 A to 279 A
WT. 4.5 TO 8.6

Nos. 250 A to 255 A
WT. 3.1 TO 7.8



Nos. 225 A to 228 A
WT. 2.7 TO 5.4

Nos. 220 A to 223 A
WT. 2.5 TO 4.8

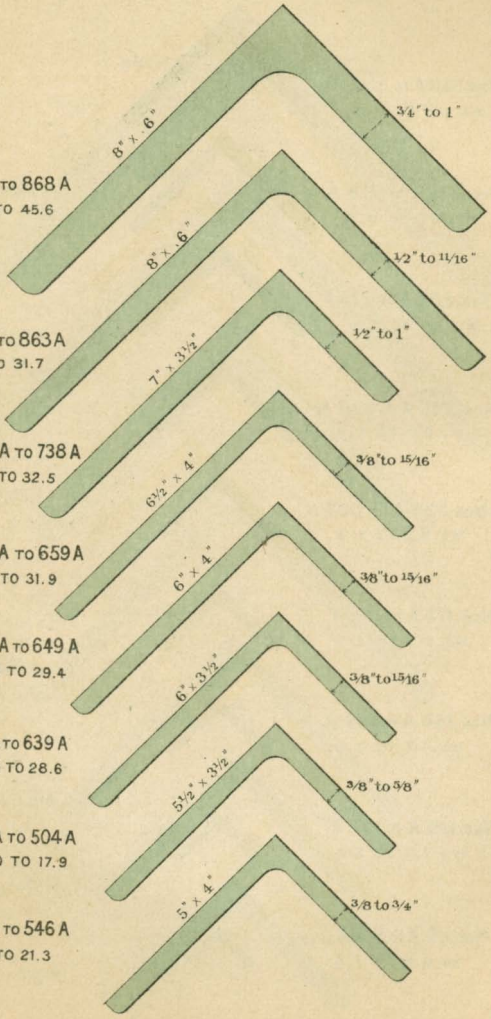
Nos. 175 A to 178 A
WT. 2.1 TO 4.1

Nos. 150 A to 154 A
WT. 1.2 TO 3.5

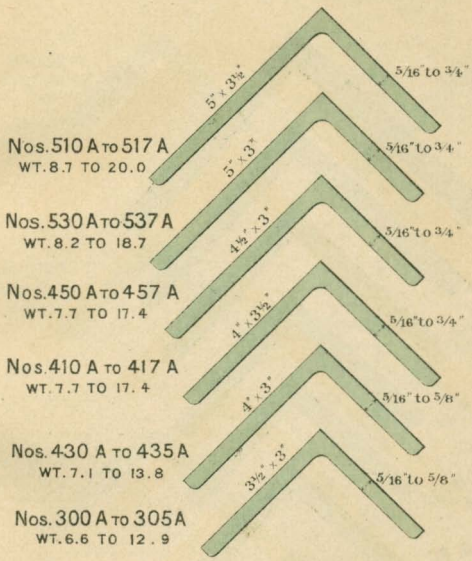
Nos. 125 A to 127 A
WT. 1.0 TO 2.0

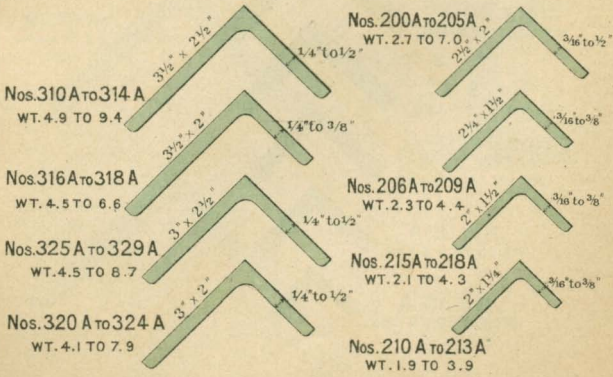
Nos. 110 A to 112 A
WT. 0.8 TO 1.5

All weights given in pounds per foot

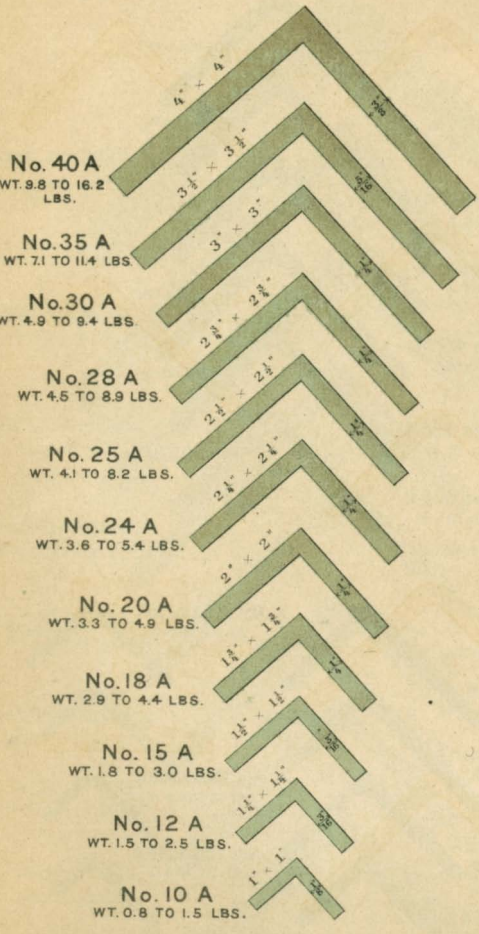


All weights given in pounds per foot.

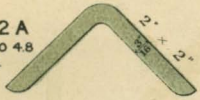




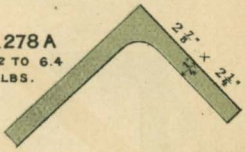
All weights given in pounds per foot



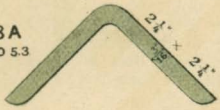
All weights given in pounds per foot.



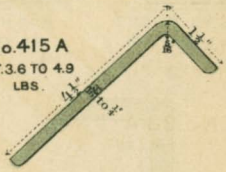
No. 22 A
WT. 2.4 TO 4.8 LBS.



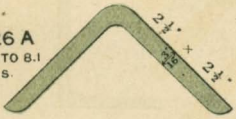
No. 278 A
WT. 4.2 TO 6.4 LBS.



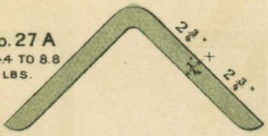
No. 23 A
WT. 2.6 TO 5.3 LBS.



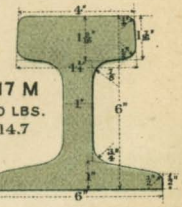
No. 415 A
WT. 3.6 TO 4.9 LBS.



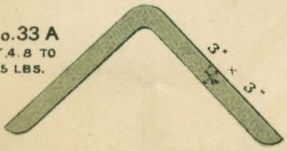
No. 26 A
WT. 3.0 TO 8.1 LBS.



No. 27 A
WT. 4.4 TO 8.8 LBS.



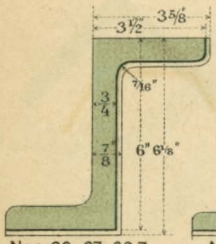
No. 217 M
WT. 50 LBS.
Area 14.7



No. 33 A
WT. 4.8 TO 11.5 LBS.

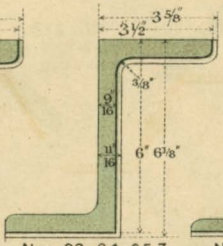
Plate No.33.

All weights given in pounds per foot.



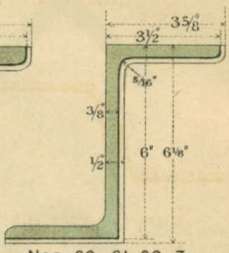
Nos. 66-67-68 Z

WTS. 29.4-31.9-34.5



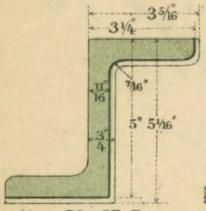
Nos. 63-64-65 Z

WTS. 22.7-25.4-28.0



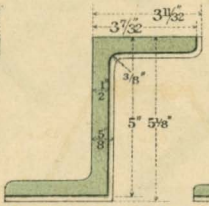
Nos. 60-61-62 Z

WTS. 15.6-18.3-21.0



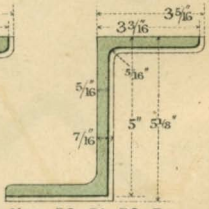
Nos. 56-57 Z

WTS. 23.7-26.0



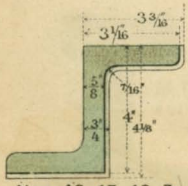
Nos 53-54-55 Z

WTS. 17.8-20.1-22.4



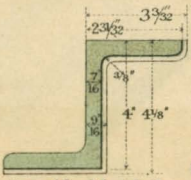
Nos. 50-51-52 Z

WTS 11.4-13.8-16.1



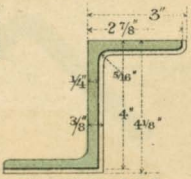
Nos. 46-47-48 Z

WTS. 18.8-20.9-22.9



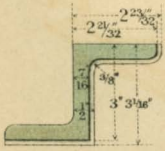
Nos. 43-44-45 Z

WTS. 13.5-15.5-17.5



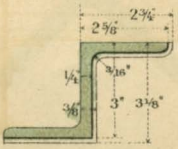
Nos. 40-41-42 Z

WTS. 7.9-9.9-11.9



Nos. 33-34-35 Z

WTS. 11.1-11.9-12.7

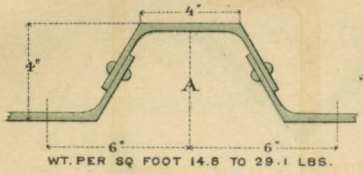


Nos. 30-31-32 Z

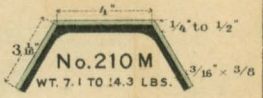
WTS. 6.6-8.3-10.0

Trough Shaped Sections for Corrugated Flooring

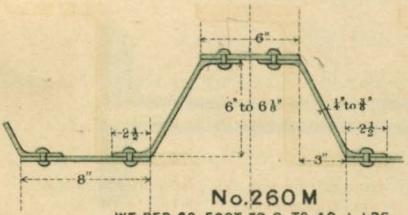
All weights given in pounds per foot.



WT. PER SQ FOOT 14.8 TO 29.1 LBS.

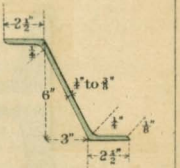


WT. 7.1 TO 14.3 LBS.

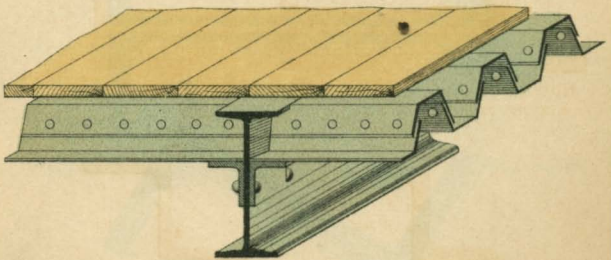


No.260 M

WT. PER SQ FOOT 20.0 TO 40.1 LBS.

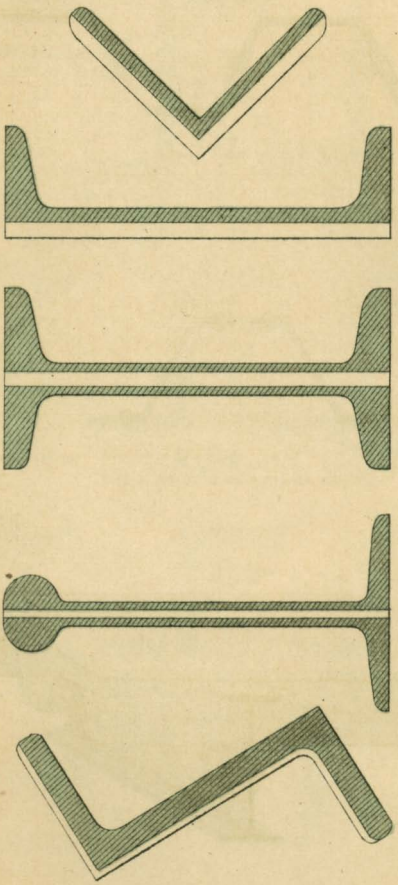


WT. PER FT. 9.8 TO 14.7 LBS.



METHOD OF INCREASING SECTIONAL AREAS.

Cross hatched portions represent the minimum sections and the blank portions the added areas.



EXTRA PRICES
ON
BEAMS AND CHANNELS

	Per lb.
Cutting to exact length with less variation than ¾ inch,	1/10c
Plain punching, one size hole in web only,	1/10c.
" " " " " flange only,	1/10c.
" " " " " both web and flange	2/10c.
" " each additional size hole,	1/10c
Assembling into girders, with bolts and separators,	3/10c.
Coping, beveling, fitting ends, cutting to length with less variation than ¾ inch, including the riveting of connection plates or connection angles with or without punching,	3/10c.
Painting or oiling (one coat) with ordinary paint or oil,	5/100c.
Fittings, whether loose or attached, such as bolts, separators, angle connections, etc.,	1½c.
Cambering beams and channels for ships or other purposes,	½c.
Bending or other unusual work,	shop rates