

Rec - Jan - 22 - 1940

ROOF PURLINS

BY

MACOMBER

MACOMBER U. S. PATENT NOS. COVERING STEEL JOISTS
1651013 - 1614248 - 1614247 - 1614249 AND OTHERS

Steel Joist and Nailer Joist Types
Macomber, Massillon and Canton Designs

GENERAL INFORMATION

SAFE LOADING TABLES

Part of the Macomber Line
of
Standard Steel Building Products

MACOMBER
I N C O R P O R A T E D
C A N T O N • O H I O

ROOF PURLINS

BY

MACOMBER

The Roof Purlin is the secondary structural member carrying the roof loadings of a building until the accumulated total is more economically supported by the Roof Trusses or other main members.

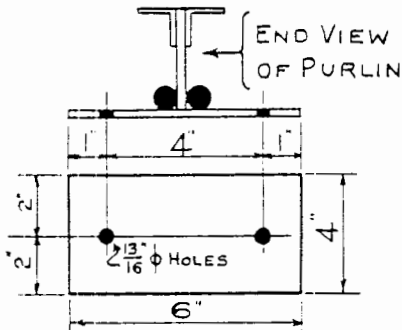
Purlins are ordinarily installed on wider spacings than floor joists and frequently have sloping supports. This requires special details which Macomber has incorporated in a joist product for the particular purpose.

In comparison with ordinary structural sections the Macomber Purlin has the advantage of increased depth with resulting economy in the distribution of steel. The metal averages greater thickness and the Purlin detail facilitates the attaching of accessory materials.

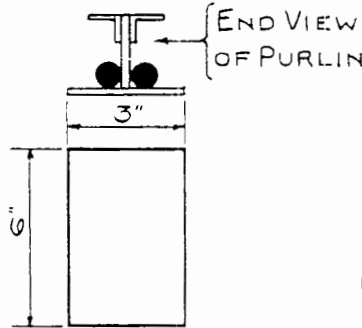
There is no need for compromise between strength and deflection limitations. Wiring and ventilating costs are reduced. Money is saved in the installation of the Purlins and in placing the roofing material. The underslung feature of the Macomber Product is of special importance. It is a rugged, dependable standardized structural product designed and manufactured to function economically as a Roof Purlin should.

The Purlin Section is an adaptation of the Steel and Nail Joists. All properties and capacities are the same as for the standard joist of the same size, type and style as indicated by the nomenclature and as manufactured by Macomber. These properties are given in other pamphlets.

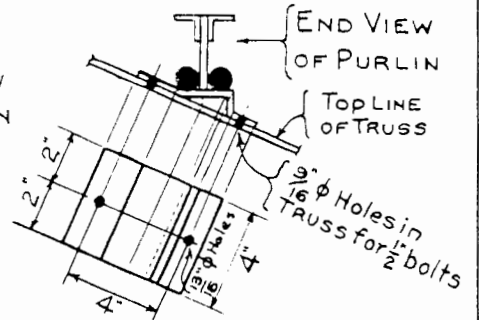
CONSTRUCTION DETAILS



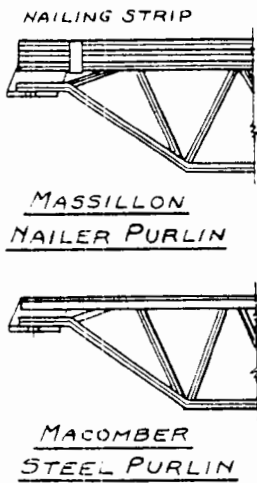
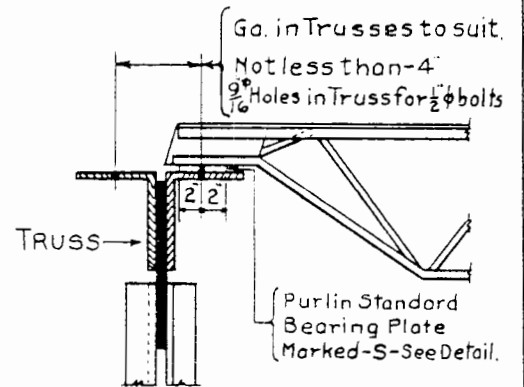
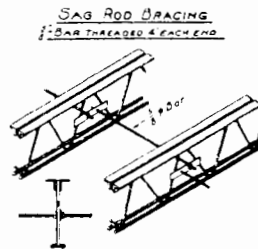
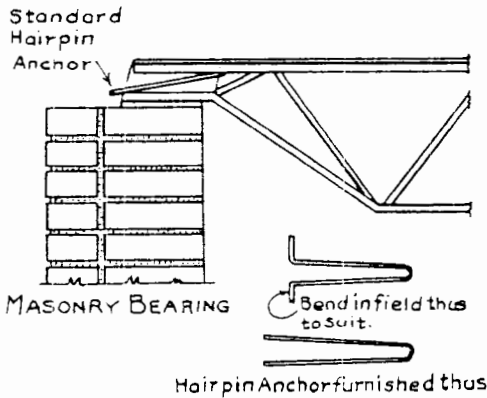
PLAN OF STANDARD PURLIN BEARING PLATE MARK-S



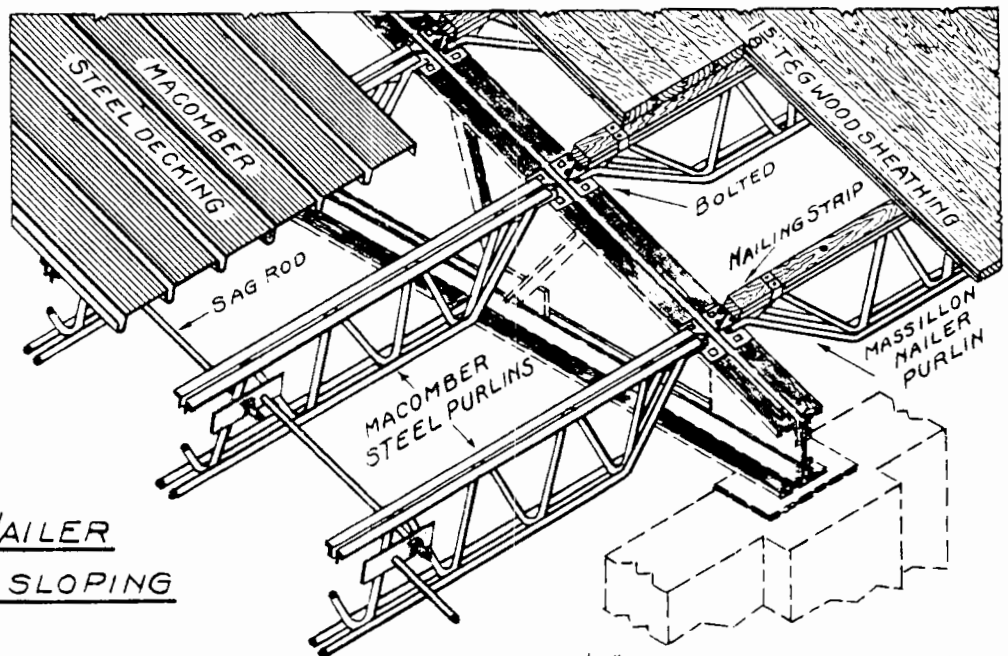
MASONRY PURLIN BEARING PLATE MARK-M



PLAN OF BENT PURLIN BEARING PLATE MARK-B

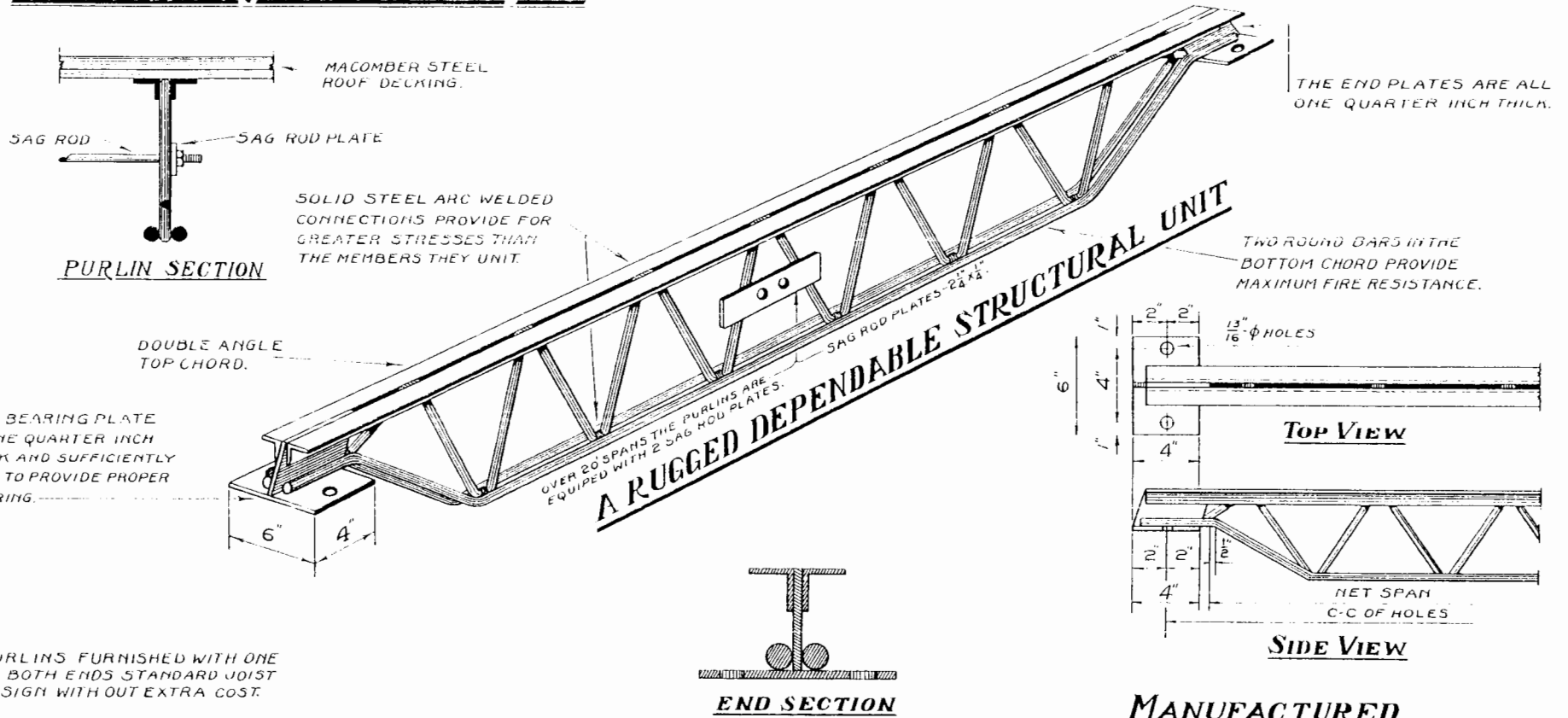


STEEL OR NAILER PURLINS ON SLOPING SUPPORTS.



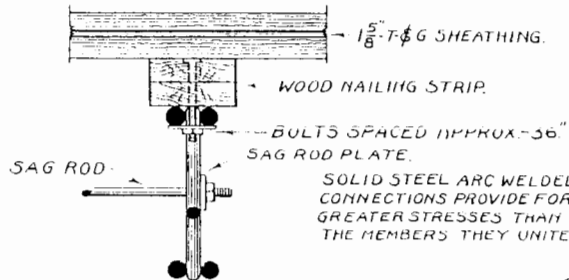
ONE SAG ROD FOR SPANS UP TO 20'-0" TWO FOR SPANS OVER 20'-0"

MACOMBER STEEL PURLIN



MANUFACTURED
By
MACOMBER INCORPORATED
CANTON, OHIO.

MASSILLON NAILER PURLIN

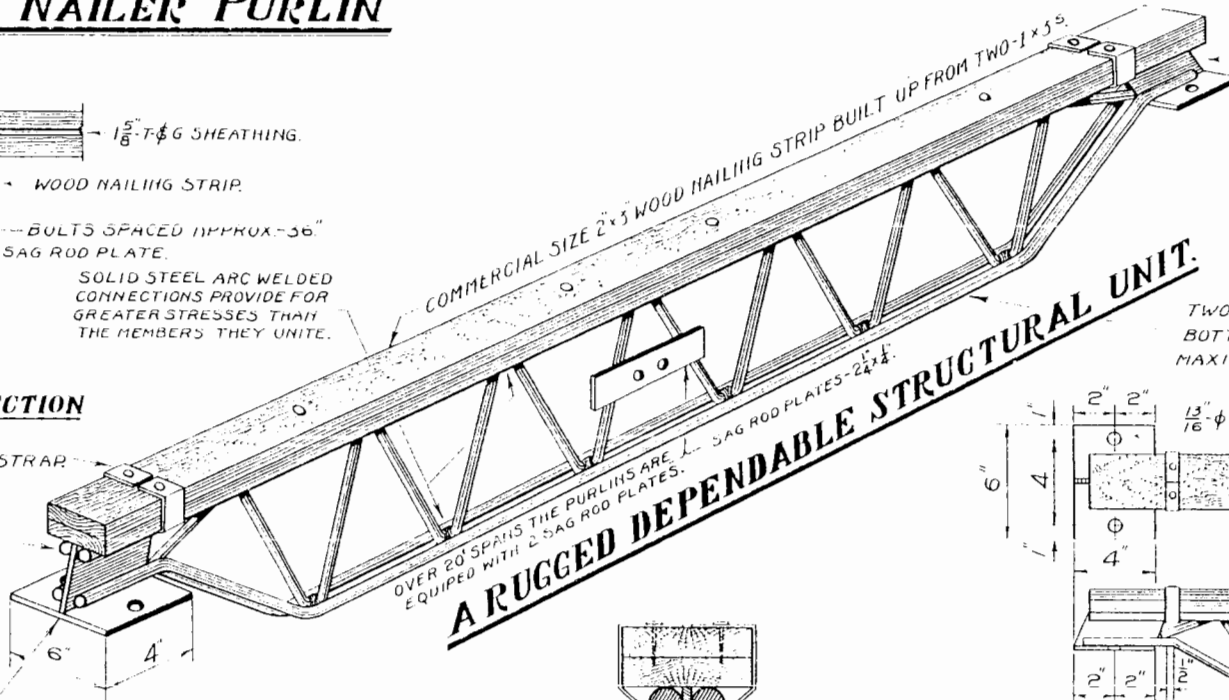


PURLIN SECTION

STEEL END STRAP
DOUBLE ROUND BAR TOP CHORD.

THE BEARING PLATE IS ONE QUARTER INCH THICK AND SUFFICIENTLY WIDE TO PROVIDE PROPER BEARING.

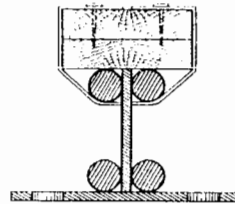
PURLINS FURNISHED WITH ONE OR BOTH ENDS STANDARD JOIST DESIGN WITH OUI EXTRA COST.



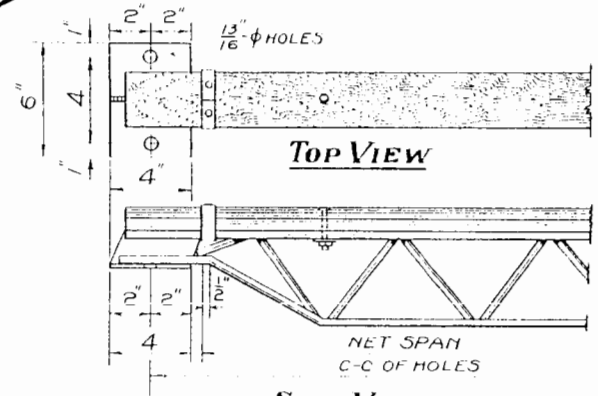
A RUGGED DEPENDABLE STRUCTURAL UNIT.

THE END PLATES ARE ALL ONE QUARTER INCH THICK.

TWO ROUND BARS IN THE BOTTOM CHORD PROVIDE MAXIMUM FIRE RESISTANCE.



END SECTION



TOP VIEW

SIDE VIEW

MANUFACTURED
By
MACOMBER INCORPORATED
CANTON, OHIO.

MACOMBER ROOF PURLINS

Macomber Roof Purlins are made to function as the secondary structural members in supporting roofs. In design and detail they do the work in a practical and economical fashion. They are a special product manufactured for a particular purpose.

In comparison with the old style structural channel purlins they have the following outstanding distinct advantages -

Macomber Purlins are underslung - giving the maximum stability to a structure.

The Purlin detail facilitates the attaching of accessory and other materials resulting in simpler and stronger construction.

The Nailor Purlins are equipped with a painted wood nailing strip of ample proportions made from two pieces of 1 x 3.

The Purlins are all easy to handle and install.

The Purlins are shipped on your order direct to the job and are complete - ready to go in place.

They will weigh on the average less than 65% of the weight of channel sections of equal strength.

The cost to Contractors of finished, painted Macomber Purlins delivered to nearest siding will not exceed by more than 15% - on the average - the Mill Price of the raw steel required in structural channels of the same strength.

By comparison with wood joists used as Roof Purlins the Macomber Nailor Purlin is a superior, more satisfactory product. It is dependable in strength and costs but little - if any - more.

Large stocks of Steel and efficient production equipment insure satisfactory delivery service on Macomber Products. The Central location permits rapid transportation to all sections of the Country.

TABLE OF COMPARISONS

STANDARD CHANNELS & MACOMBER STEEL PURLINS

STANDARD CHANNELS			MACOMBER STEEL PURLINS			
CHANNEL SIZE	WEIGHT PER FOOT	RESISTING MOMENTS	PURLIN SIZE	AVERAGE WEIGHT PER FOOT	RESISTING MOMENTS	
10"	15.3	241000	166	9.9	237000	
			147	10.9	246130	
9"	13.4	189000	165	8.6	197000	
			164	7.8	162000	
			146	9.5	206400	
8"	11.5	146000	163	6.8	132000	
			144	7.1	142000	
			125	7.9	146400	
7"	9.8	108000	143	6.4	115000	
			124	6.8	121770	
			123	6.0	101300	
6"	8.2	77500	122	5.1	80500	
			103	5.8	83560	
			102	4.9	66850	

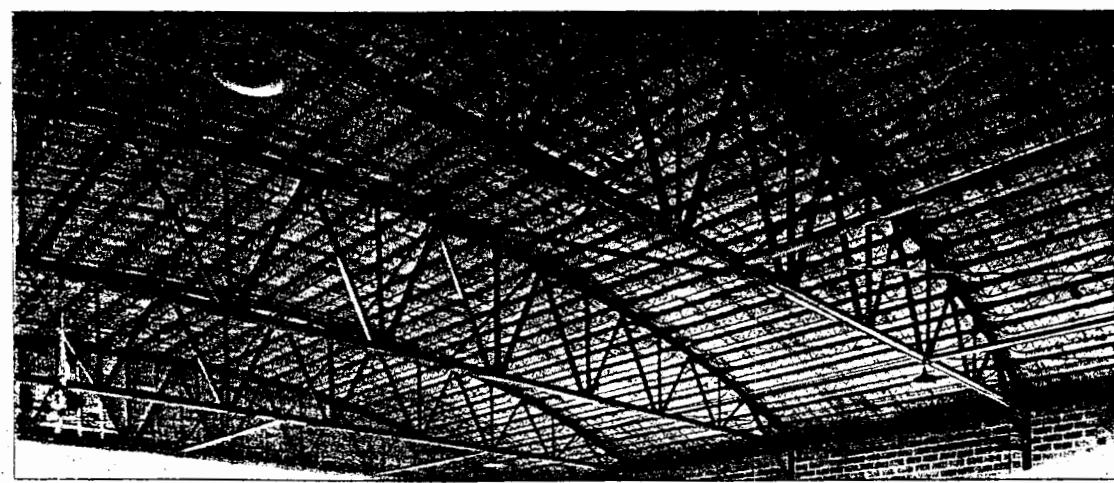
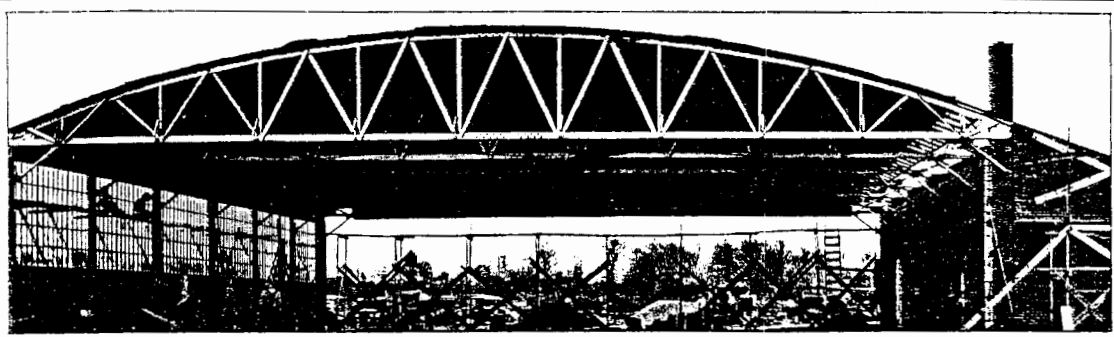
Steel Joist Purlins

Nailer Joist Purlins

STEEL ROOF TRUSSES

BY

MACOMBER



M A C O M B E R

'LONGSPAN' JOISTS

UNITED STATES PATENT NUMBERS 1651032 - 1748423 - 1678738 - 1669095

SAFE LOADING TABLES
CONSTRUCTION DETAILS

One of the Macomber Line
of
Standard Steel Building Products

M A C O M B E R

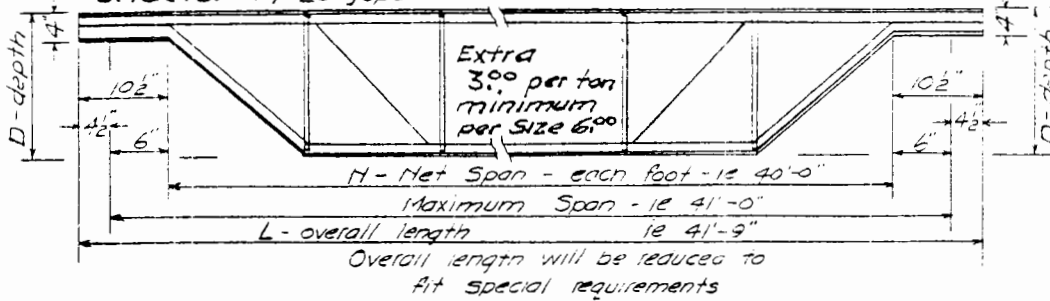
A S H L A N D , O H I O

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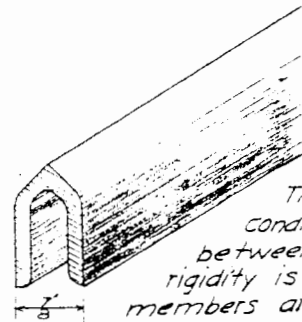
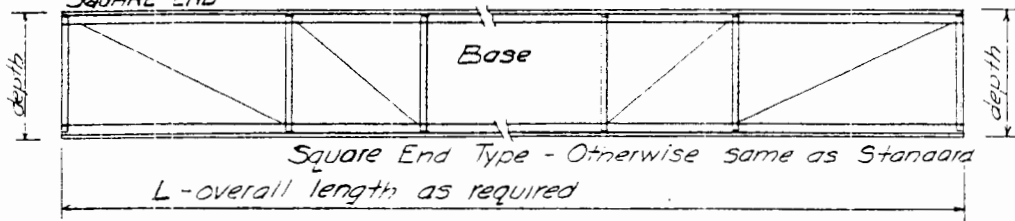
'LONGSPAN'

TYPES OF MACOMBER "LONGSPAN" JOISTS

Underslung "Longspan" Joist Section



SQUARE END



MACOMBER "LONGSPAN" JOISTS

Macomber "Longspan" Joists meet the demand for economical, light weight, fireproof floor and roof construction on longer spans than covered by Macomber Bar Joists.

The same inherent features of economy and dependability in the Bar Joist are secured in using the "Longspan" Joists. All chords and web members are of angles with a unique design detail developing the maximum of lateral rigidity.

The standard type of "Longspan" Joist incorporates the same principle of span flexibility and standardization as used in the Macomber Bar Joist. Each joist covers a span range of twelve inches which simplifies design and installation. Salvage value is market value.

The designation of each joist incorporates the depth - chord section letter - and minimum span; i.e., - 28 D 51 - this joist is 28" deep, is made up of the D section top and bottom chord angles and covers a range of span from 51'0" to 52'0" inclusive.

The joist depths are standardized at 20" - 22" - 24" - 28" - 32" and 36". There are ten sets of sections. This combination of depth and section amply provides for all normal requirements.

The Joist is also produced in other types - Square Ends - Hip or Center Slope - and Full Length Slope. Standard Slope on sloping joists is 1/4" per foot. For other outlines including Curved Chords refer to Macomber for information.

MACOMBER STANDARD

STEEL BUILDING PRODUCTS

BAR JOISTS

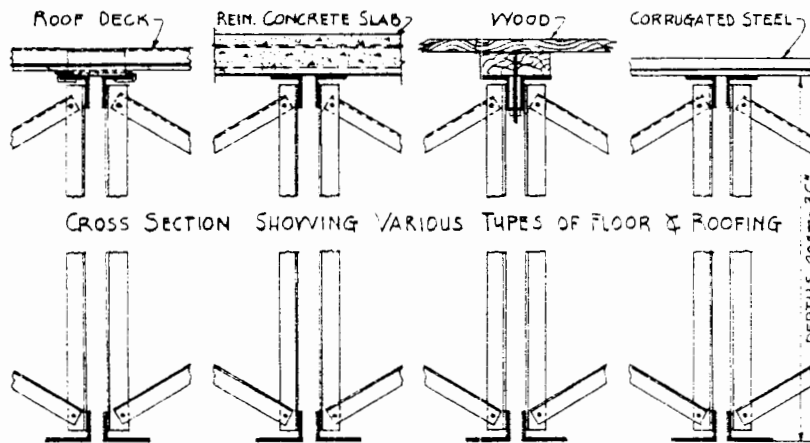
"LONGSPAN" JOISTS

NAILER JOISTS

ROOF TRUSSES

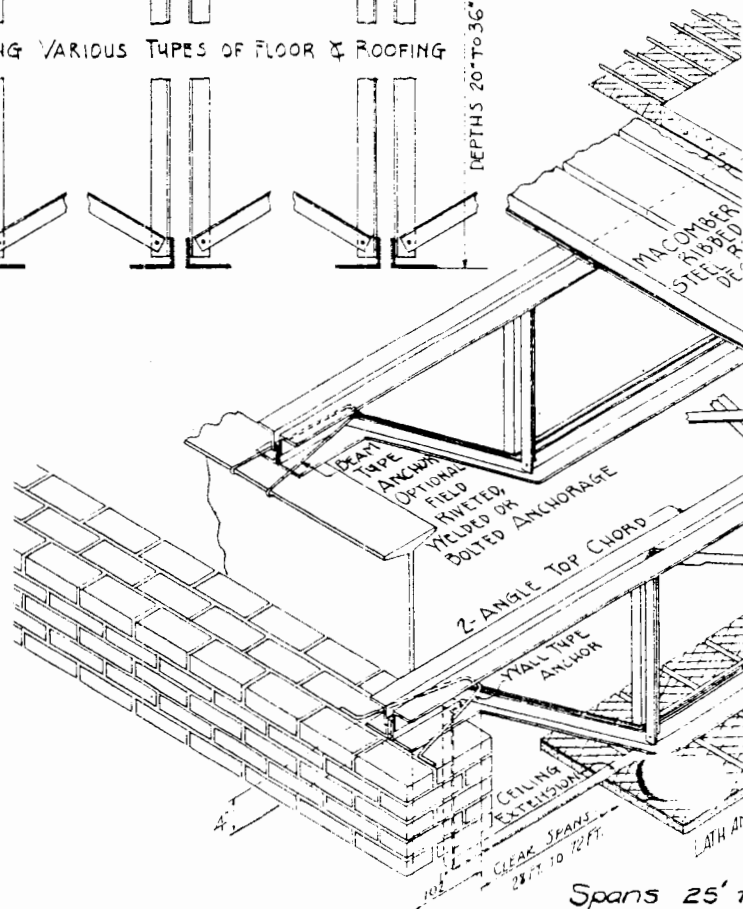
ROOF DECKING

ACCESSORY MATERIAL



CHORD SECTIONS

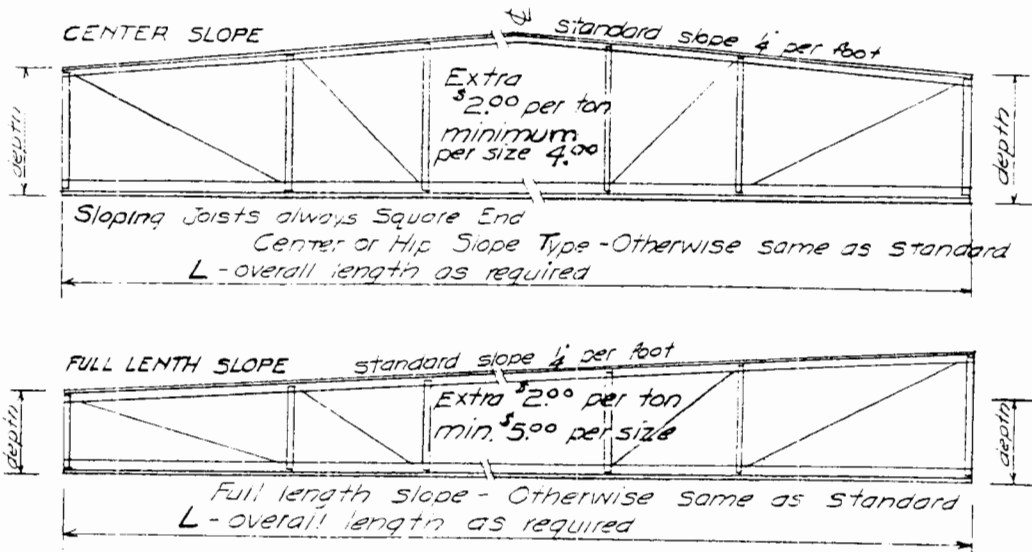
section letter	Each chord 2 angles	
	Top	Bottom
A	3-2- $\frac{3}{16}$	2-2- $\frac{3}{16}$
B	3-2 $\frac{1}{2}$ - $\frac{3}{16}$	2 $\frac{1}{2}$ -2- $\frac{3}{16}$
C	3-2- $\frac{1}{4}$	3-2 $\frac{1}{2}$ - $\frac{3}{16}$
D	3-2 $\frac{1}{2}$ - $\frac{1}{4}$	2 $\frac{1}{2}$ -2- $\frac{1}{4}$
E	3 $\frac{1}{2}$ -3- $\frac{1}{4}$	3-2 $\frac{1}{2}$ - $\frac{1}{4}$
F	3-3- $\frac{5}{16}$	3-2- $\frac{5}{16}$
G	3 $\frac{1}{2}$ -3- $\frac{5}{16}$	3 $\frac{1}{2}$ -3- $\frac{1}{4}$
H	4-3- $\frac{5}{8}$	4-3- $\frac{1}{4}$
J	3 $\frac{1}{2}$ -3- $\frac{3}{8}$	3 $\frac{1}{2}$ -3- $\frac{5}{16}$
K	4-3- $\frac{3}{8}$	4-3- $\frac{5}{16}$



Section panel p

MBER 1' JOISTS

TYPES OF MACOMBER "LONGSPAN" JOISTS

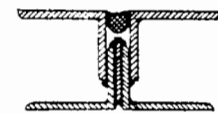
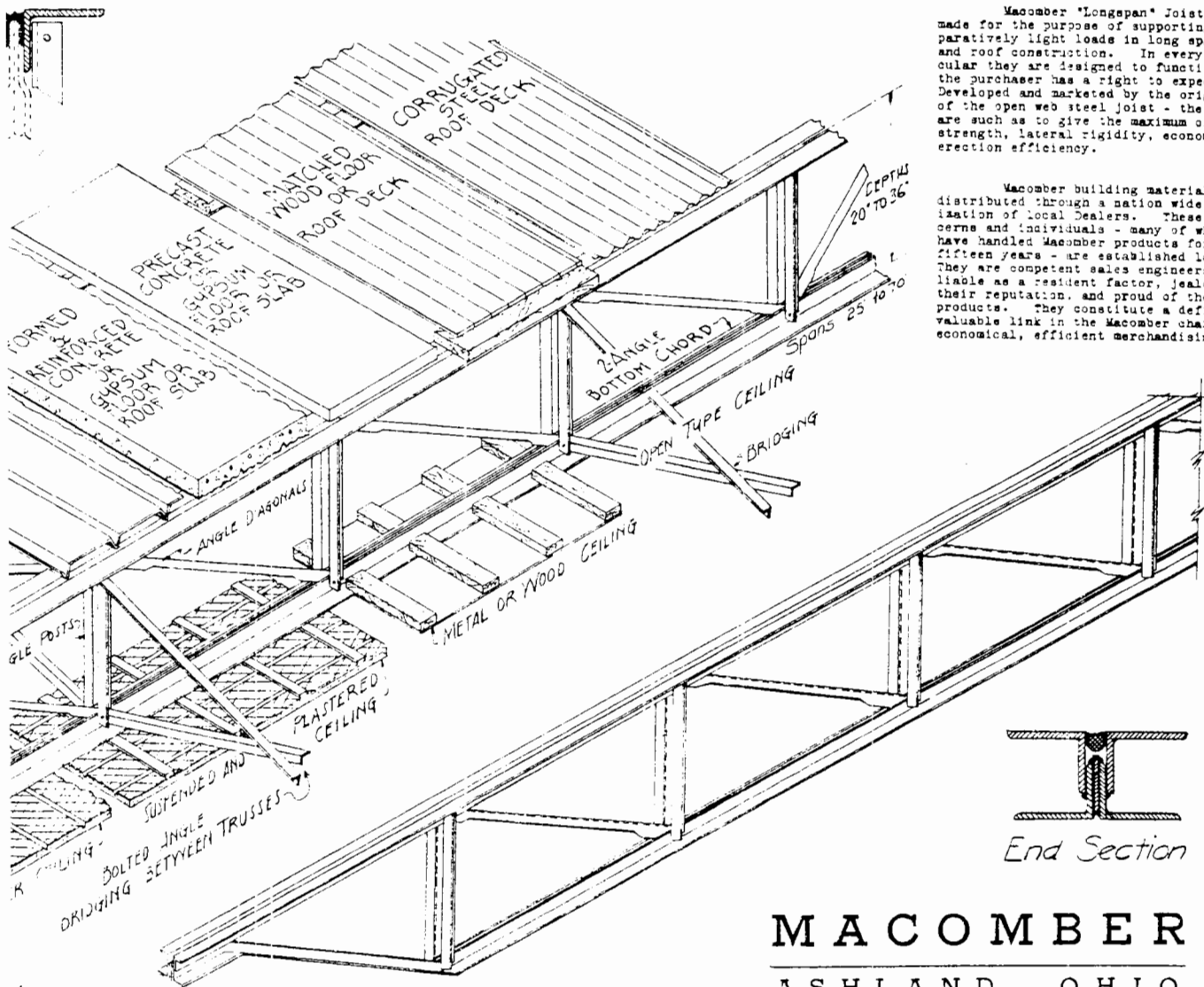


All diagonal web angles are pressed to l-shape at the ends, provides a good welding and constant spread chord angles. Lateral eased and the web stronger

MACOMBER "LONGSPAN" JOISTS

Macomber 'Longspan' Joists are made for the purpose of supporting comparatively light loads in long span floor and roof construction. In every particular they are designed to function as the purchaser has a right to expect. Developed and marketed by the originator of the open web steel joist - the details are such as to give the maximum of strength, lateral rigidity, economy and erection efficiency.

Macomber building materials are distributed through a nation wide organization of local Dealers. These concerns and individuals - many of whom have handled Macomber products for ten to fifteen years - are established locally. They are competent sales engineers, reliable as a resident factor, jealous of their reputation, and proud of their products. They constitute a definite valuable link in the Macomber chain of economical, efficient merchandising.



End Section

MACOMBER
ASHLAND, OHIO

MACOMBER 'LONGSPAN' JOISTS

TOTAL SAFE LOADING IN POUNDS PER FOOT UNIFORMLY DISTRIBUTED

This table shows the total uniform safe loading in pounds per linear foot of joists. The dead weight of floor or roof construction is to be deducted in determining the live-load capacity. These loads assume the joists are bridged and the top member is braced laterally. Joists are designated by their depth - the section letters and the minimum span.

20" Depth "Longspan" Joists 20"										28" Depth "Longspan" Joists 28"											
Span	A	B	C	D	E	F	G	H	J	K	Span	A	B	C	D	E	F	G	H	J	K
28'	375	433	475	530	543	620	690	690			44'	227	250	282	332	382	425	443	513	513	655
29'	362	417	459	512	524	600	665	665			45'	222	245	276	326	373	416	433	503	503	640
30'	350	403	443	495	506	580	643	643			46'	213	239	269	318	366	407	425	492	492	622
31'	328	378	429	480	490	562	623	623			47'	204	234	264	306	358	398	415	481	481	596
32'	307	354	416	462	475	544	603	603			48'	196	227	258	293	350	390	406	470	470	570
33'	289	332	400	434	460	527	585	585			49'	188	217	253	281	342	382	398	450	462	548
34'	272	314	377	408	447	512	567	567			50'	181	209	248	270	328	374	390	430	452	526
35'	257	296	356	386	434	497	551	552			51'	174	201	241	259	315	361	376	414	443	505
36'	243	279	336	364	422	484	525	537			52'	167	193	232	249	303	348	362	398	434	487
37'	229	265	319	345	411	470	497	522			53'	161	185	224	240	292	335	348	382	426	468
38'	218	250	303	326	395	447	472	509			54'	155	179	215	231	282	322	335	368	412	452
39'	207	238	287	310	376	424	447	493			55'	149	172	207	223	272	311	323	355	396	435
40'	197	227	273	295	358	404	425	470			56'	144	166	200	215	262	300	312	343	382	420
22" Depth "Longspan" Joists 22"										32" Depth "Longspan" Joists 32"											
Span	A	B	C	D	E	F	G	H	J	K	Span	A	B	C	D	E	F	G	H	J	K
32'	320	370	446	483	583	682	682	682	790	790	52'			239	264	302	384	384	399	462	462
33'	310	358	432	468	565	660	660	660	767	767	53'			235	259	296	378	378	392	453	453
34'	302	348	419	454	548	630	640	640	745	745	54'			231	254	290	370	370	384	445	445
35'	285	328	396	429	518	595	621	623	724	724	55'			227	249	285	357	364	377	437	437
36'	269	310	374	406	490	561	587	605	704	704	56'			223	245	280	345	357	370	428	428
37'	255	293	355	384	464	533	553	590	674	684	57'			219	241	275	332	348	364	421	421
38'	241	278	336	364	440	505	527	574	636	666	58'			214	230	271	322	335	358	410	414
39'	229	264	319	345	418	480	500	547	605	650	59'			207	222	266	310	325	351	396	407
40'	218	251	303	328	398	455	475	520	575	633	60'			200	215	257	300	314	342	383	400
41'	207	239	289	312	378	434	453	495	550	605	61'			194	208	249	290	304	332	370	393
42'	198	228	275	298	360	413	432	473	524	577	62'			187	202	241	281	294	322	360	387
43'	188	217	262	284	343	394	412	450	497	549	63'			181	196	233	272	284	312	348	381
44'	180	207	250	272	328	377	394	430	478	523	64'			176	190	226	264	275	302	338	369
24" Depth "Longspan" Joists 24"										36" Depth "Longspan" Joists 36"											
Span	A	B	C	D	E	F	G	H	J	K	Span	A	B	C	D	E	F	G	H	J	K
36'	290	333	389	389	483	561	561	653	653	755	58'				235	308	342	357	357	414	518
37'	279	320	378	378	470	545	545	635	635	735	59'				231	303	335	351	351	407	492
38'	265	304	368	368	458	532	532	618	618	715	60'				228	298	330	345	345	400	475
39'	251	289	349	359	446	518	518	600	603	697	61'				225	288	325	340	340	394	462
40'	239	274	332	349	427	497	505	570	588	680	62'				221	278	318	334	334	387	445
41'	227	261	317	332	406	474	490	544	574	664	63'				218	270	309	322	328	381	432
42'	216	249	302	317	387	450	468	517	560	633	64'				214	262	300	312	324	375	420
43'	206	238	288	302	369	430	447	493	547	605	65'				209	254	290	303	319	370	407
44'	197	227	275	289	352	412	426	470	523	577	66'				202	246	281	294	314	359	392
45'	188	217	262	275	336	393	407	450	500	550	67'				196	239	272	285	309	349	381
46'	180	207	251	263	322	376	390	430	479	527	68'				190	232	265	277	303	338	370
47'	173	198	240	252	308	360	373	413	458	505	69'				185	225	257	269	295	329	360
48'	166	190	231	242	297	345	358	396	437	483	70'				180	219	250	261	286	320	349

M A C O M B E R
BOWSTRING
STEEL ROOF TRUSSES

U. S. PATENT NO. 1878738 AND OTHERS

SAFE LOADING TABLES

DETAIL INFORMATION

One of the Macomber Line
of
Standard Steel Building Products

M A C O M B E R
I N C O R P O R A T E D
C A N T O N • O H I O

DESCRIPTION

Through the Macomber system of standardization, Bowstring Roof Trusses are manufactured for all spans from 30 feet to 120 feet. Each truss is designed for a specific maximum span. The end construction of the truss is detailed in accordance with Macomber patents and develops the stresses for any span down to the minimum span of the truss.

All designing is in accordance with A.I.S.C. Specifications. Total Safe Loadings per linear foot of clear span for both the maximum and the minimum spans of each truss are shown on the back of this folder.

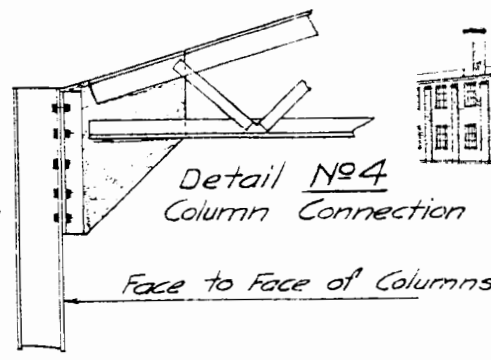
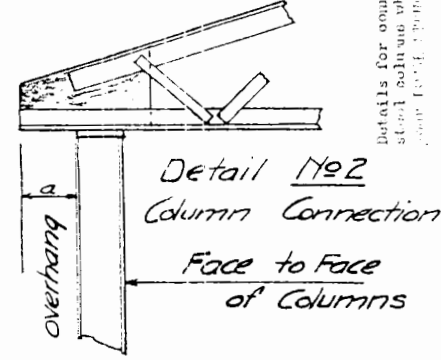
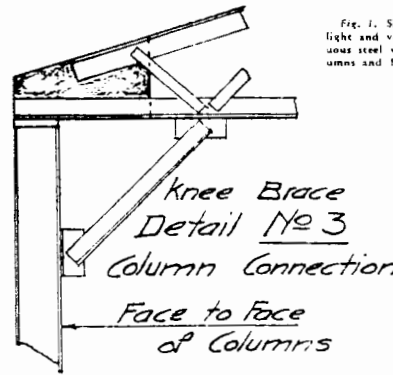
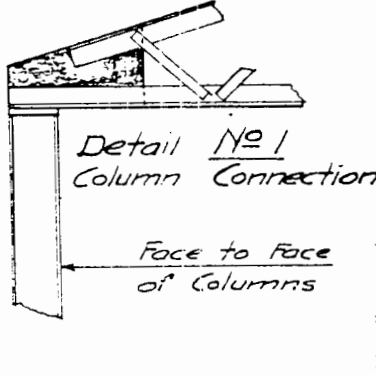
All trusses are designed with conventional double angle top and bottom chords. Angles and plates serve for the web and end construction. All shop connections are fabricated by electric arc welding. Rigid inspection insures connections stronger than the members they unite.

For spans 44 feet or less trusses are shipped in one piece. For spans from 46 to 84 feet trusses are shipped in two sections with field splice at the center. For spans 86 to 120 feet the trusses are shipped in three sections with splices at approximately the one-third points.

All splices are designed for field riveting or bolting. Three-quarter inch bolts are furnished for all field splices. Bracing members are furnished with the trusses in accordance with requirements.

The standardized form of Macomber Roof Trusses permits an Architect or Engineer to layout and design a building with these trusses as easily and as accurately as with simple beams. Any Macomber Dealer can submit definite recommendation and quote on the required material. Only slight delay is occasioned when special conditions require reference to our Engineering Department.

The standardized features of Macomber Trusses speed up every step from the preliminary layouts to the final completion of project involving roof trussing. This product was originated and developed by Macomber. Installations are scattered through nearly every state and territory. It is a rugged dependable structural unit.



Details for connecting trusses to steel columns which are furnished by your local Macomber STEEL FABRICATOR

DETAILS REQUIRED IN ORDERING

It is recommended that quotations be asked for and orders placed for trusses and truss bracing on a lump sum basis freight allowed to nearest railway siding. Bill plans for the project should be submitted to the Macomber dealer or our home office when you are asking for quotation. It is frequently to the purchaser's advantage to combine and place orders for purlins, steel windows, columns, etc., with the truss order. This centers the responsibility for the steel requirements and results in savings in handling the combined order. The following information is necessary to quote intelligently on trusses and bracing:

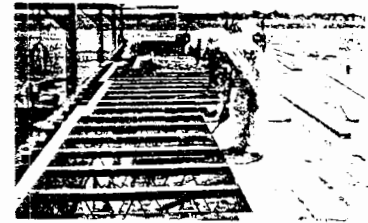
- TOTAL LOAD:** This includes the roof live load, the dead load of steel construction, the dead load of ceiling construction and the amount and location of concentrated loads. Each should be clearly specified. Our engineers are available to make definite recommendations as to live and dead loads where our experience can be utilized to advantage.
- SPAN:** The clear span between supporting columns or pilasters is required.

- LIMITATION IN SPACING OF TRUSSES:** Where possible the center to center spacing of trusses should be left to the Macomber dealer or engineer to utilize the full carrying capacity of the trusses best suited for the requirement. The exact spacing of trusses should be stated where the building design determines the spacing.

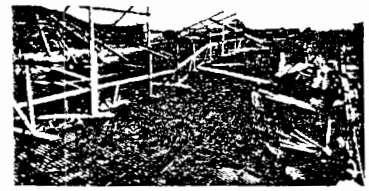
The following information is essential to enter and ship truss orders:

- Truss symbol and number of trusses.
- Overall length of truss.
- Center to center spacing of trusses and where bracing is to be furnished type of truss bracing.
- Punching in top chord for attaching purlin construction, except where Macomber is to furnish the purlins.
- (Masonry pilasters) Maximum permissible bearing pressure.
- (Steel columns) Details for punching trusses or connecting to columns.
- Such other punching details as may be required or attaching suspended balconies, hoists, monorail systems, column knee bracing, etc.

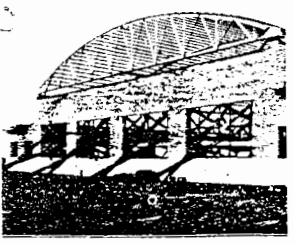
MACOMBER BOWSTRING STEEL TRUSS



Nailing 1" Wood Roof Deck on Macomber Purlins



Ready to pour Concrete Roof Deck over Theater—Metal Lath, Bar Joists, Trusses and Steel by Macomber.



Macomber All Steel Frame Building—140' Note low 'Leanto' roof

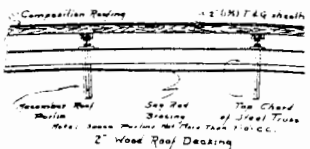
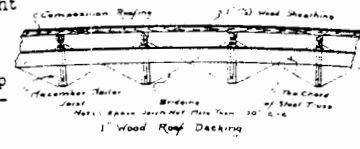


Fig. 1. Simple Curve Truss Building—light and ventilation provided by continuous steel windows secured to Steel Columns and Framing above masonry walls.

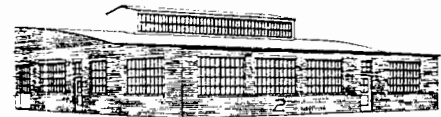
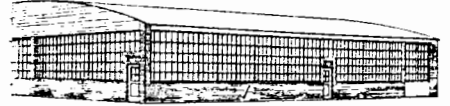


Fig. 2. Curve Truss Building—'Leanto' Roof projecting from main structure framed in Truss additional light and ventilate portion of Building.

Fig. 3. Standard Form of Airplane Hangar—one story 'Leanto' along one side of building.

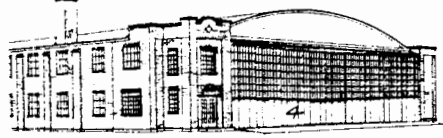
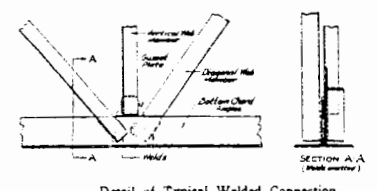
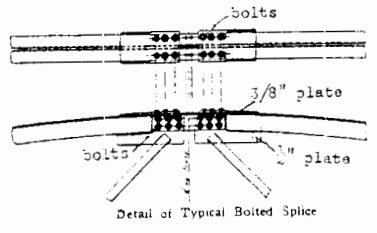


Fig. 4. Standard Form Hangar—two story 'Leanto' side of building.



Detail of Typical Welded Connection

All shop connections are fabricated with modern structural electric arc welding. The welds are adequately designed and individually inspected. The result is a solid rugged dependable structural unit.



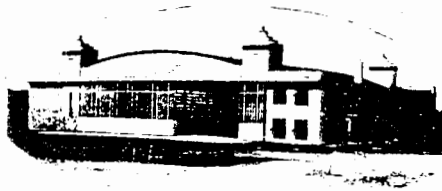
Detail of Typical Bolted Splice

All splices are assembled in the truss during fabrication. Trusses are match marked. Fit in the field is assured.

Trusses up to and including 44 foot spans are shipped in one piece. For spans of 46 to 84 feet the trusses are spliced at the center. For spans of 86 to 120 feet the trusses are spliced at approximately the one-third points.

MEMBER RING TRUSSES

AND BRACES



TRUSS BRACING

All trusses are to be braced horizontally between the top chords. Where purlins are bolted to the trusses they function as horizontal top chord bracing. Otherwise starred horizontal struts are to be provided.

For ordinary conditions we recommend the following bracing for Macomber Bowstring Trusses:

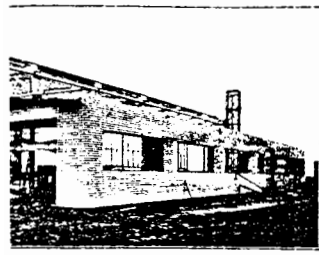
Spans up to 69' ---- One row of X Bracing at the center line of the trusses. If purlins are not bolted to the top chord, then add one row of horizontal starred struts between top chords - or - One set of X Bracing at center line of the truss in end panels and every fourth or fifth intervening panel with top and bottom horizontal starred struts full length of building at center line.

Spans 70' to 84' ---- One row of X Bracing at the center line of the trusses and horizontal starred strut in end and every third or fourth intervening panel between the bottom chord of trusses. If purlins are not bolted to top chord of truss then add horizontal starred struts between top chords at the center line.

Spans 86' to 100' --- Two rows of X Bracing at about the one-third point of the trusses and horizontal starred struts in end and every second or third intervening panel between bottom chord of trusses. If purlins are not bolted to top chord of trusses, then add horizontal starred struts between top chord along both bracing lines.

Spans 100' to 120' -- Two rows of X Bracing at about the one-third points and horizontal starred struts in each panel between bottom chords. If purlins are not bolted to top chord of trusses then add horizontal starred struts between top chord or trusses along with bracing lines.

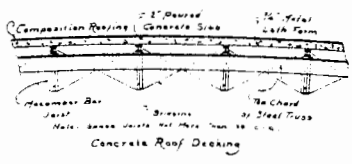
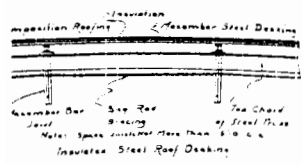
Sway Bracing ----- When the trusses rest on columns which are not set in masonry walls then the end panels and every fourth or fifth intervening panel are to be sway braced.



ft. Exterior walls finished with face brick, on sides of building.



Wood Roof Deck over Bus Terminal—Nailer Purlins, Trusses and Steel by Macomber.



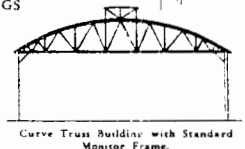
Types of decking on Macomber Purlins supported by Macomber Roof Trusses. Write for information and details on Macomber specially designed steel Roof Decking Plates.

MACOMBER BOWSTRING ROOF TRUSSES

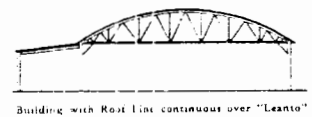
END VIEWS OF TYPICAL ONE STORY BUILDINGS



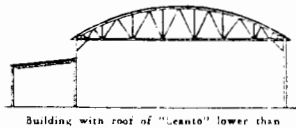
Simple Curve Truss Building.



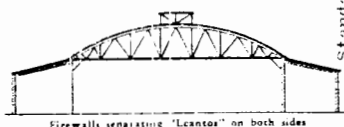
Curve Truss Building with Standard Monitor Frame.



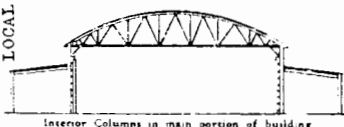
Building with Roof Line continuous over "Lean-to" along one side of building.



Building with roof of "lean-to" lower than main portion of building.

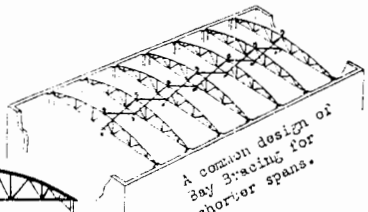


Firewalls terminating "lean-tos" on both sides of main portion of building.

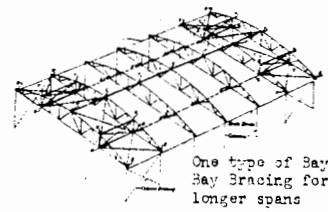


Interior Columns in main portion of building for Crane Runway.

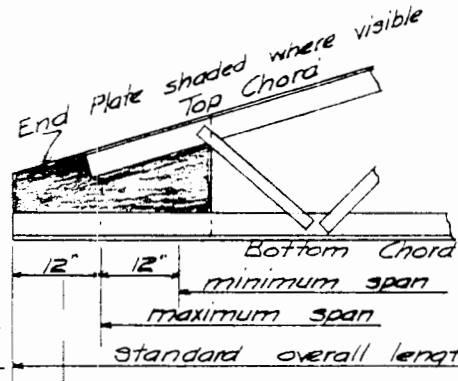
Standard One Story Buildings as developed by using Macomber Standardized Bowstring Roof Trusses with Structural Steel as furnished by your LOCAL STRUCTURAL STEEL FABRICATOR



A common design of Bay Bracing for shorter spans.



One type of Bay Bracing for longer spans.



End Plate shaded where visible Top Chord

2x4 Plats Section Starred Strut

Truss cut back to required length Standard Truss End Detail

MEMBER STANDARD BOWSTRING ROOF TRUSSES

Span	CHORD ANGLE SIZES		Bottom Chord Size	Bottom Chord Area
	Top Chord Size	Area		
20	2-2-4	1.88	2-2-3/8	1.42
25	2 1/2-2 1/2-4	2.38	2-2-4	1.88
30	3-3-4	2.88	2 1/2-2 1/2-4	2.38
35	4-3-4	3.38	3-3-4	2.88
40	4-4-4	3.88	4-3-4	3.38
45	5-3 1/2-5/8	5.12	4-4-4	3.88
50	6-3 1/2-5/8	5.74	5-3 1/2-5/8	5.12
55	6-4-3/8	7.22	6-3 1/2-5/8	5.74
60	6-4-1/2	9.50	6-4-3/8	7.22
65	6-4-5/8	11.72	6-4-1/2	9.50

LOADINGS

All loadings are shown for Total Uniform Safe Loads with trusses braced laterally as in standard roof construction. The center height of all trusses is approximately one tenth of the maximum span.

Wind does not materially effect curved roof designs with low center rise. In addition wind on this type of roof eliminates other live loads. In consequence, wind loadings on Macomber Bowstring Roof Trusses are ordinarily disregarded.

In the absence of Building Code requirements governing Live Loads, we recommend as follows:

South of Mason-Dixon Line	25 pounds per square foot
Extreme Northern States	40 pounds per square foot
Balance of United States	30 pounds per square foot

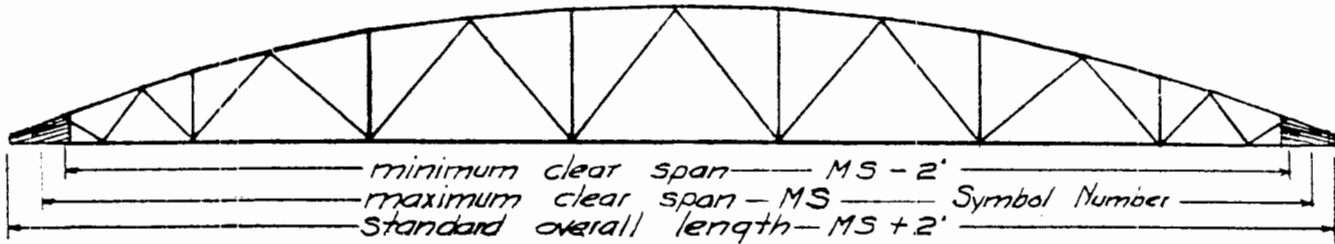
For Dead Loads the following information may be used as a guide.

Item	Weight per square foot
Metal Lath and plaster ceiling	10
Trusses - Bracing - average	5
Metal Roof Decking or Corrugated Sheets	3
Concrete slab - 2" thick	21
Wood sheathing 1"	3
Wood sheathing 2"	7
Prepared Roofing	5
Purlins	2

SAFE LOADING TABLES

MACOMBER STANDARD BOWSTRING ROOF TRUSSES

Total uniform loading in pounds per linear foot of clear span



The maximum span of truss is shown in the Truss Symbol. The minimum span of truss is two feet shorter than the maximum span. The standard overall length of truss is two feet longer than the maximum span. Truss lengths are cut back to fit requirements. Loading capacities per linear foot are shown for the maximum and the minimum clear span lengths of each truss. Interpolate for intermediate spans.

Truss Symbol	Safe Loads Per Lin Foot		Truss Symbol	Safe Loads Per Lin Foot		Truss Symbol	Safe Loads Per Lin Foot		Truss Symbol	Safe Loads Per Lin Foot	
	Min. Span	Max. Span		Min. Span	Max. Span		Min. Span	Max. Span		Min. Span	Max. Span
30-A	830	720	50-D	925	850	66-F	940	885	74-H	1220	1150
32-A	765	675	52-D	885	815	68-F	910	860	76-H	1185	1120
34-A	715	635	54-D	850	780	70-F	880	835	78-H	1155	1090
36-A	670	600	56-D	815	760	72-F	855	810	80-H	1125	1065
38-A	635	570	58-D	785	735	74-F	830	790	82-H	1100	1040
40-A	600	540	60-D	760	710	76-F	805	770	84-H	1070	1015
42-A	570	515	62-D	730	685	78-F	785	750	86-H	1040	995
44-A	540	490	64-D	705	665	80-F	765	730	88-H	1015	970
			66-D	685	645	82-F	745	710	90-H	995	950
			68-D	665	625	84-F	730	695	92-H	975	930
			70-D	645	610				94-H	950	910
30-B	1095	955				50-G	1550	1425	96-H	930	890
32-B	1015	895				52-G	1485	1370	98-H	910	870
34-B	950	840				54-G	1425	1320	100-H	890	855
36-B	890	795	46-E	1160	1055	56-G	1365	1275	110-H	810	775
38-B	840	755	48-E	1105	1010	58-G	1320	1230			
40-B	790	715	50-E	1055	975	60-G	1275	1190	70-J	1635	1535
42-B	750	680	52-E	1015	935	62-G	1230	1150	72-J	1580	1490
44-B	715	650	54-E	975	900	64-G	1190	1115	74-J	1535	1450
46-B	680	620	56-E	935	870	66-G	1150	1080	76-J	1480	1410
48-B	650	595	58-E	900	840	68-G	1115	1050	78-J	1440	1375
50-B	620	570	60-E	870	815	70-G	1080	1020	80-J	1400	1340
			62-E	840	785	72-G	1050	990	82-J	1370	1310
			64-E	810	760	74-G	1020	965	84-J	1335	1280
			66-E	785	740	76-G	990	940	86-J	1305	1250
			68-E	760	715	78-G	965	915	88-J	1270	1220
			70-E	735	695	80-G	940	895	90-J	1240	1195
			72-E	715	675	82-G	915	870	92-J	1210	1170
			74-E	695	660	84-G	890	850	94-J	1185	1145
			76-E	675	640	86-G	870	830	96-J	1165	1120
			78-E	655	625	88-G	850	810	98-J	1140	1095
			80-E	640	610	90-G	830	795	100-J	1115	1075
			82-E	625	595	92-G	810	775	110-J	1010	975
			84-E	610	580	94-G	790	760	120-J	925	895
						96-G	775	745			
						98-G	760	730	86-K	1720	1645
			46-F	1385	1270	100-G	740	715	88-K	1680	1610
			48-F	1320	1215				90-K	1640	1570
			50-F	1265	1165	60-H	1525	1420	92-K	1605	1540
			52-F	1215	1120	62-H	1475	1375	94-K	1570	1505
			54-F	1165	1080	64-H	1425	1330	96-K	1535	1475
			56-F	1115	1040	66-H	1380	1290	98-K	1505	1445
			58-F	1075	1005	68-H	1340	1255	100-K	1474	1415
			60-F	1035	975	70-H	1295	1220	110-K	1335	1285
			62-F	1000	940	72-H	1255	1185	120-K	1225	1180
			64-F	970	910						

The Truss Symbol shows by number the maximum span of the truss and by letter the chord size. All loadings are on the assumption the trusses are properly braced laterally.

STEEL JOIST LOADING TABLE

FORM 100

MACOMBER U. S. PATENT NOS. COVERING STEEL JOISTS
1651013 · 1614248 · 1614247 · 1614249 AND OTHERS

TOTAL SAFE LOADINGS

For All

STEEL JOISTS
NAILER JOISTS
ROOF PURLINS

as manufactured by

MACOMBER

Part of the Macomber Line
of
Standard Steel Building Products

MACOMBER
I N C O R P O R A T E D
C A N T O N • O H I O

STEEL JOISTS BY MACOMBER

The loading capacity of all Steel Joists and Nailer Joists as manufactured by Macomber is in accordance with the Steel Joist Institute's standard loading table for Steel Joists—Macomber uses the one loading table for both types of Joist. This table is given in two ways in this loading table pamphlet: Page 6—Linear foot total capacity; Pages 4 and 5—The total capacity per square foot of floor area for various spacings.

Particularly advantageous points to consider in all joists as manufactured by Macomber are:

Thickness of metal;

Solid steel arc welded connections which are stronger than the members they unite;

Double section top and bottom chords which provide maximum lateral rigidity and simplify the attaching of accessories;

The Warren truss design providing capacity to resist reverse stresses under concentrated loadings;

Panel point spacing to permit ample latitude in pipe installation;

End designs giving maximum span flexibility—sturdiness and economy.

Macomber is the originator of the open web Steel Joist and the oldest manufacturer of the product. Steel Joists manufactured by Macomber have advantages found combined only in Macomber products. All Macomber Joists are rugged dependable structural units. They amply meet the requirements of every generally accepted standard specification applying to Steel Joists. They will perform as the purchaser has a right to expect.

As a specialist in the Steel Joist field Macomber manufactures a complete list and range of Steel Joists and Nailer Joists. The carrying capacity of all these joists is as tabulated in the loading tables given in this pamphlet. This standard Institute loading table is shown on Page 6 and amplified to show loadings per square foot for various spacings on Pages 4 and 5.

Macomber Steel Joist: This joist is a standard all purpose joist for the construction of fire proof floors. The top chord is double angles and the bottom chord is double bars.

Massillon Steel Joist: This is the oldest steel joist on the market. Both top and bottom chords

are of round bars. It is noted for lateral rigidity and general ruggedness.

Canton Steel Joist: This is a standard joist using angles in both the top and bottom chords. The span flexibility is reduced and ceiling extensions are not required. It is used where wider ceiling contact is desired.

Buffalo Steel Joist: This standard joist uses angles in the top chord and bars in the bottom chord. The special feature is the inverting of the top chord angles. This permits a desirable detail in supporting the concrete slab and the bonding of the slab to the joists. It is particularly adapted to large installations.

Macomber Nailer Joist: This is the Macomber Steel Joist fitted with a commercial size 2x3 laminated wood strip for the direct application of flooring.

Massillon Nailer Joist: This is the Massillon Steel Joist fitted with a commercial size 2x3 laminated wood strip for the direct application of flooring.

Canton Nailer Joist: This is the Canton Steel Joist fitted with a commercial size 2x3 laminated wood strip for the direct application of flooring.

Purlin Sections are an adaption of the Steel Joist to roof purlin conditions. Bearing plates are punched for bolting to supports and sag rod plates are attached for sag rod bracing. Purlins are made in Steel Joist and Nailer Joist types as follows: Macomber Purlin, Massillon Purlin, Canton Purlin, Macomber Nailer Purlin, Massillon Nailer Purlin and Canton Nailer Purlin. For loading capacity of all Purlin Sections use this loading table.

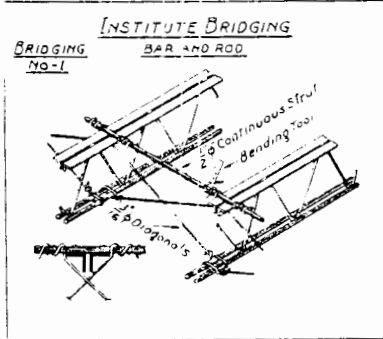
For General Specifications: As the Steel Joist Institute has amply covered the subject of joists and joist floor construction in the Institute's standard specification we recommend Architects specifying Steel Joists and their installation as being in accordance with the Standard Specifications of the Steel Joist Institute.

The Macomber plant at Canton, Ohio, is centrally located for prompt transportation to all parts of the country. It is specially designed and adapted to the manufacture of Macomber products.

COMBINATIONS OF JOISTS BY MACOMBER

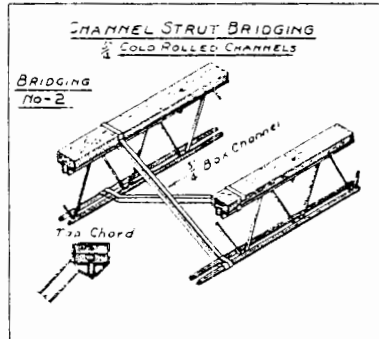
And Various Types of Bridging

MACOMBER STEEL JOIST
and Institute Bridging



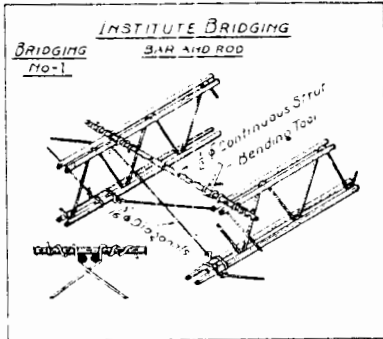
The Macomber Steel Joist has two angles in the top chord and two round bars in the bottom chord.

MACOMBER NAILER JOISTS
and 3/4" Channel Bridging



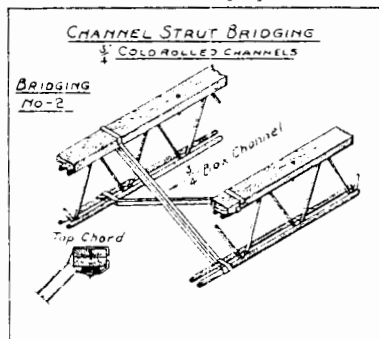
All Nailer Joists made by Macomber have a 2" x 3" commercial size laminated wood nailing strip.

MASSILLON STEEL JOIST
and Institute Bridging



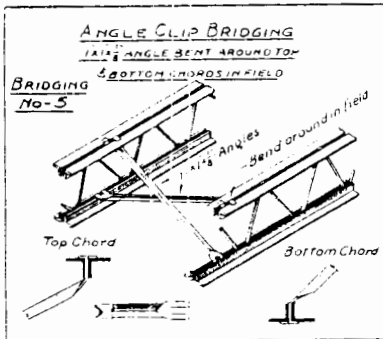
The Massillon Steel Joist has two round bars in both the top and bottom chords.

MASSILLON NAILER JOIST
and 3/4" Channel Bridging



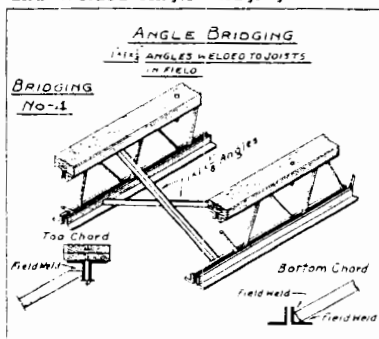
All Nailer Joists made by Macomber have the nailing strip bolted to the top chord—It is a positive connection.

CANTON STEEL JOIST
and Angle Clip Bridging



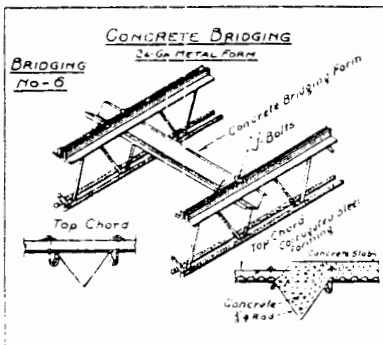
The Canton Steel Joist has two angle sections in both the top and bottom chords.

CANTON NAILER JOIST
and Welded Angle Bridging



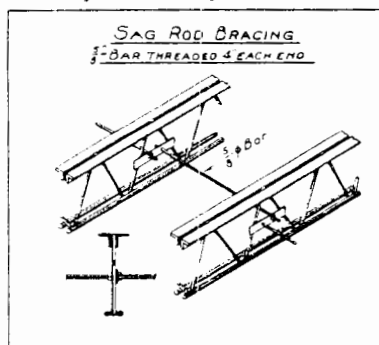
The laminated wood nailing strip on all Nailer Joists made by Macomber increases the quality of the strip and lateral rigidity of the joist.

BUFFALO STEEL JOIST
and Concrete Bridging



The Buffalo Steel Joist has two inverted angle sections in the top chord and two round bars in the bottom chord.

MACOMBER ROOF PURLINS
and Sag Rod Bracing



For wider spacing of Purlins or joists use sag rod bracing. Purlins are of the Steel Joist or the Nailer Joist type.

JOISTS BY MACOMBER

TOTAL SAFE LOADING IN POUNDS PER SQUARE FOOT UNIFORMLY DISTRIBUTED

This loading table is the standard adopted by the Steel Joist Institute. All Joists by Macomber are designed to meet the loadings of this table and in accordance with the Steel Joist Institute's requirements. It is used for all Steel Joists, Nailer Joists and Roof Purlins.

SPAN	Joist on Max. Span	Joist on Min. Span	Total Load	SPACING C-C OF JOISTS IN INCHES																
				12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	28	30
4' 0"		S.J. 81-4	3200	800	740	684	640	600	564	533	503	480	458	437	417	400	385	369	343	320
5' 0"	S.J. 81-4	81-5	3200	640	593	547	511	480	450	426	405	383	365	349	333	320	308	294	274	256
6' 0"	81-5	81-6	3180	530	490	454	425	399	374	354	336	318	303	290	276	265	255	245	228	212
7' 0"	81-6	81-7	2814	402	372	344	322	302	283	268	255	241	230	220	210	201	193	185	173	161
8' 0"	81-7	81-8	2464	308	285	264	246	232	217	206	195	185	176	168	161	154	148	142	132	123
9' 0"	81-8	81-9	2187	243	225	208	195	182	171	162	154	146	139	133	127	122	117	112	104	97
10' 0"	81-9	81-10	1970	197	183	169	158	148	139	132	125	118	113	108	103	99	95	91	85	79
		82-10	3500	350	324	300	280	263	246	233	222	210	200	191	182	175	168	161	150	140
11' 0"	81-10	81-11	1782	162	150	138	130	122	114	108	103	97	92	89	85	81	78	75	70	65
	82-10	82-11	3179	289	268	246	231	217	204	192	183	173	165	158	150	145	139	133	124	115
12' 0"	81-11	81-12	1644	137	127	117	110	103	97	91	87	82	78	75	71	69	66	63	59	55
	82-11	82-12	2916	243	225	208	195	182	171	162	154	146	139	133	127	122	117	112	104	97
		102-12	3504	292	271	249	234	219	206	194	185	175	166	159	151	146	140	134	125	117
13' 0"	81-12	81-13	1508	116	108	99	93	87	82	78	74	70	66	64	61	58	56	54	50	47
	82-12	82-13	2691	207	192	177	166	156	146	138	131	124	118	113	108	104	99	95	89	83
		102-13	3224	248	230	213	199	186	175	166	158	149	142	136	130	124	119	114	105	98
14' 0"	81-13	81-14	1400	100	93	85	80	75	70	66	63	60	57	55	52	50	48	46	43	40
	82-13	82-14	2492	178	165	152	143	134	125	119	113	107	102	97	93	89	85	82	76	71
		102-14	2996	214	198	183	171	161	151	143	135	128	122	117	112	107	103	99	92	86
15' 0"	81-14	81-15	1305	87	80	75	70	65	61	58	55	52	50	47	45	44	42	40	37	35
	82-14	82-15	2325	155	143	132	123	116	109	103	98	93	88	84	81	78	74	71	66	62
	102-14	102-15	2805	187	173	160	150	141	132	124	118	113	107	102	98	94	90	86	80	75
		103-15	3645	243	225	208	195	182	171	162	154	146	139	133	127	122	117	112	104	97
		123-15	4080	272	252	232	217	204	192	181	172	163	155	148	141	136	131	125	116	109
16' 0"	81-15		1232	77	71	66	61	58	54	51	49	46	44	42	40	39	37	35	33	31
	82-15		2192	137	127	117	110	103	97	91	87	82	78	75	71	69	66	63	59	55
	102-15	102-16	2624	164	152	140	132	124	116	109	104	98	93	90	86	82	79	76	71	66
		103-16	3408	213	198	183	171	161	151	143	134	127	121	116	111	107	103	99	92	86
		104-16	4160	260	240	222	208	195	183	174	165	156	148	142	135	130	125	120	112	104
	123-15	3840	240	222	205	192	179	168	159	152	144	137	131	125	120	115	110	102	96	
17' 0"	102-16	102-17	2465	145	134	124	116	109	102	97	92	87	83	79	76	73	70	67	62	58
	103-16	103-17	3213	189	175	162	152	143	134	126	120	114	108	103	99	95	91	86	80	75
	104-16	104-17	3910	230	212	196	184	173	162	153	145	138	131	126	120	115	111	106	99	92
		123-16	3604	212	197	182	170	160	150	142	133	126	120	115	110	106	102	98	91	85
18' 0"	102-17	102-18	2340	130	120	112	104	97	92	87	82	78	74	71	68	65	62	60	56	52
	103-17	103-18	3042	169	156	145	135	127	120	113	107	102	97	92	88	85	81	78	73	68
	104-17	104-18	3690	205	190	176	164	154	145	137	130	123	117	112	107	103	99	95	88	82
	123-17	123-18	3402	189	175	162	151	142	133	126	120	114	108	103	99	95	91	87	81	76
		124-18	4248	236	218	202	189	177	167	157	149	142	135	129	123	118	113	109	101	94
19-0	102-18	102-19	2204	116	107	100	93	87	82	77	73	70	66	63	61	58	56	54	50	46
	103-18	103-19	2869	151	140	129	121	113	107	101	95	91	86	82	79	76	73	70	65	61
	104-18	104-19	3496	184	170	158	147	138	130	123	116	111	105	100	96	92	88	85	79	74
	123-18	123-19	3230	170	157	146	136	128	120	113	107	102	97	93	89	85	82	79	73	68
	124-18	124-19	4028	212	197	182	170	160	150	142	133	126	120	115	110	106	102	98	91	85
	145-19	5472	288	266	247	231	216	204	192	182	173	165	157	150	144	138	133	123	115	
20' 0"	102-19		2100	105	97	90	84	79	74	70	66	63	60	57	55	53	50	48	45	42
	103-19		2740	137	127	117	110	103	97	91	87	82	78	75	72	69	66	63	59	55
	104-19		3340	167	154	143	134	125	118	111	105	100	95	91	87	84	80	77	72	67
	123-19	123-20	3060	153	141	131	122	115	108	102	97	92	87	83	80	77	74	71	66	61
	124-19	124-20	3840	192	177	165	154	144	136	128	121	115	110	105	100	96	92	89	82	77
		125-20	4740	237	219	203	190	178	167	158	150	142	136	129	124	119	114	109	102	95
	145-19	5200	260	240	222	208	195	183	174	165	156	148	142	135	130	125	120	112	104	

MACOMBER LOADING TABLE for STEEL JOISTS, NAILER JOISTS and ROOF PURLINS—Continued

SPAN	Joist on Max. Span	Joist on Min. Span	Total Load	SPACING C-C OF JOISTS IN INCHES																
				12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	28	30
21' 0"	S.J. 123-20	S.J. 123-21	2910	139	128	119	111	104	98	93	88	83	79	76	73	70	67	64	60	56
	124-20	124-21	3654	174	161	149	139	131	123	116	110	104	100	95	91	87	84	80	75	70
	125-20	125-21	4515	215	198	184	172	161	152	143	136	129	123	117	112	108	103	99	92	86
	145-20	145-21	4956	236	218	202	189	177	167	157	149	142	135	129	123	118	113	109	101	94
22' 0"	123-21	123-22	2794	127	117	109	102	96	90	85	80	76	73	69	66	64	61	59	54	51
	124-21	124-22	3476	158	146	136	127	119	112	105	100	95	90	86	83	79	76	73	68	63
	125-21	125-22	4312	196	181	168	157	147	138	131	124	118	112	107	102	98	94	91	84	78
	145-21	145-22	4730	215	198	184	172	161	152	143	136	129	123	117	112	108	103	99	92	86
23' 0"	123-22	123-23	2668	116	107	100	93	87	82	77	73	70	66	63	61	58	56	54	50	46
	124-22	124-23	3335	145	134	124	116	109	102	97	92	87	83	79	76	73	70	67	62	58
	125-22	125-23	4117	179	165	154	143	134	126	119	113	107	102	98	93	90	86	83	77	72
	145-22	145-23	4531	197	183	169	158	148	139	132	125	118	113	108	103	99	95	91	85	79
24' 0"	123-23	123-24	2544	106	98	91	85	80	75	71	67	64	61	58	55	53	51	49	46	43
	124-23	124-24	3192	133	123	114	106	100	94	89	84	80	76	73	70	67	64	62	57	53
	125-23	125-24	3936	164	151	141	131	123	116	109	103	98	94	89	86	82	79	76	70	66
	146-23	146-24	5688	237	219	203	190	178	167	158	150	142	136	129	123	119	114	110	101	95
25' 0"	145-24	145-25	4150	166	153	142	133	124	117	110	105	100	95	91	87	83	80	77	71	66
	146-24	146-25	5450	218	201	187	174	163	154	145	138	131	124	119	114	109	104	100	93	87
	147-25	147-26	6550	262	242	224	210	196	185	175	165	157	150	143	137	131	126	121	112	105
	166-25	166-26	6175	247	228	212	198	185	175	165	156	148	141	135	129	124	119	114	106	99
26' 0"	145-25	145-26	4004	154	142	132	123	116	109	103	97	92	88	84	80	77	74	71	66	62
	146-25	146-26	5252	202	187	173	162	152	143	135	127	121	116	110	105	101	97	93	87	81
	147-25	147-26	6318	243	224	208	194	182	177	162	153	146	139	132	127	122	117	112	104	97
	166-25	166-26	5954	229	212	197	183	172	162	153	145	137	131	125	120	115	110	106	98	92
27' 0"	145-26	145-27	3861	143	132	123	114	107	101	95	90	86	82	78	75	72	69	66	61	57
	146-26	146-27	5049	187	173	160	150	140	132	125	118	112	107	102	98	94	90	86	80	75
	147-26	147-27	6075	225	208	193	180	169	159	150	142	135	129	123	117	113	108	104	97	90
	166-26	166-27	5724	212	195	181	169	158	149	141	133	126	121	115	110	106	101	97	90	85
28' 0"	145-27	145-28	3724	133	123	114	106	100	94	89	84	80	76	73	70	67	64	62	57	53
	146-27	146-28	4872	174	161	149	139	131	123	116	110	104	100	95	91	87	84	80	75	70
	147-27	147-28	5852	209	193	179	167	157	148	139	132	126	120	114	109	105	100	97	90	84
	166-27	166-28	5516	197	183	169	158	148	139	132	125	118	113	108	103	99	95	91	85	79
29' 0"	145-28	145-29	3692	139	129	120	111	104	98	93	88	83	79	76	73	70	67	64	60	56
	146-28	146-29	4840	180	167	155	145	136	128	121	114	108	104	99	95	91	87	84	80	75
	147-28	147-29	5820	215	200	186	174	163	154	145	137	130	124	118	113	109	104	100	93	87
	166-28	166-29	5336	184	170	158	147	138	130	123	116	110	105	100	96	92	88	85	79	74
30' 0"	145-29	145-30	3547	136	126	117	108	101	95	90	86	82	78	75	72	69	66	62	57	53
	146-29	146-30	4695	177	164	152	142	133	125	118	112	107	102	98	94	90	86	83	79	74
	147-29	147-30	5675	210	195	181	169	158	149	141	133	126	121	115	110	106	101	97	90	85
	166-29	166-30	5160	172	159	148	138	129	121	115	109	103	98	94	90	86	83	79	74	69
31' 0"	145-30	145-31	3458	134	124	115	106	100	94	89	84	80	76	73	70	67	64	60	56	52
	146-30	146-31	4606	175	162	150	140	131	123	116	110	104	100	95	91	87	84	80	75	70
	147-30	147-31	5586	208	193	179	167	157	148	139	132	126	120	114	109	105	100	97	90	84
	166-30	166-31	4991	161	149	138	129	121	114	107	102	97	92	88	84	81	78	74	69	64
32' 0"	145-31	145-32	3369	132	122	113	104	98	93	88	83	79	76	73	70	67	64	60	56	52
	146-31	146-32	4517	173	160	149	139	131	123	116	110	104	100	95	91	87	84	80	75	70
	147-31	147-32	5497	206	191	177	165	155	146	137	130	124	118	113	109	104	100	96	89	83
	166-31	166-32	4832	151	140	129	121	113	107	101	95	91	86	82	79	76	73	70	65	60
	167-31	5856	183	169	157	146	137	129	122	116	110	105	100	96	92	88	85	79	73	

INSTRUCTIONS FOR USE OF TABLES—

Macomber Steel Joists are manufactured in standard stock sizes. The first part of the joist symbol is the standard S. J. I. section number. The last part of the joist symbol is the minimum span of the joist in feet. The maximum span is one foot greater than the minimum span.

All loads are computed for the clear span. Deduct width of beam flange to determine clear span.

Opposite the clear span in the first column, follow the table to the right until the proper figure for total dead and live load is reached. At the head of this column will be found the proper joist spacing. Intermediate spans are obtained by interpolation.

When there is a choice between two or three joists for a particular span the deeper joist is the more economical. Between two joists of equal depth, choose the one which permits the wider spacing. Maximum satisfactory spacing for floors, 24"; for roofs, 30".

For exceptionally heavy live loads, or for heavy concentrations, we will furnish especially designed joists.

NOTE—

When used on the maximum span, the standard joist has four inches of bearing. The above loads assume that the top member of the joist is braced laterally as in the standard floor construction.

MACOMBER INCORPORATED CANTON, OHIO.

In accordance with engineering standards and stresses as approved by all established authorities.

In accordance with Simplified Practice Recommendation No. R 94-30 of the Bureau of Standards, U.S Dept of Commerce.

STANDARD PROPERTIES AND ALLOWABLE TOTAL LOADS IN POUNDS PER LINEAR FOOT FOR STEEL JOISTS AS MANUFACTURED BY MACOMBER

This loading table shows the total loading capacity in pounds per linear foot for all steel joists and all hanger bolts as manufactured by Macomber

Adopted August 20, 1929, by the Steel Joist Institute.

On the two preceding pages this loading table is developed to show the total loading in pounds per square foot for various spacings of the joists.

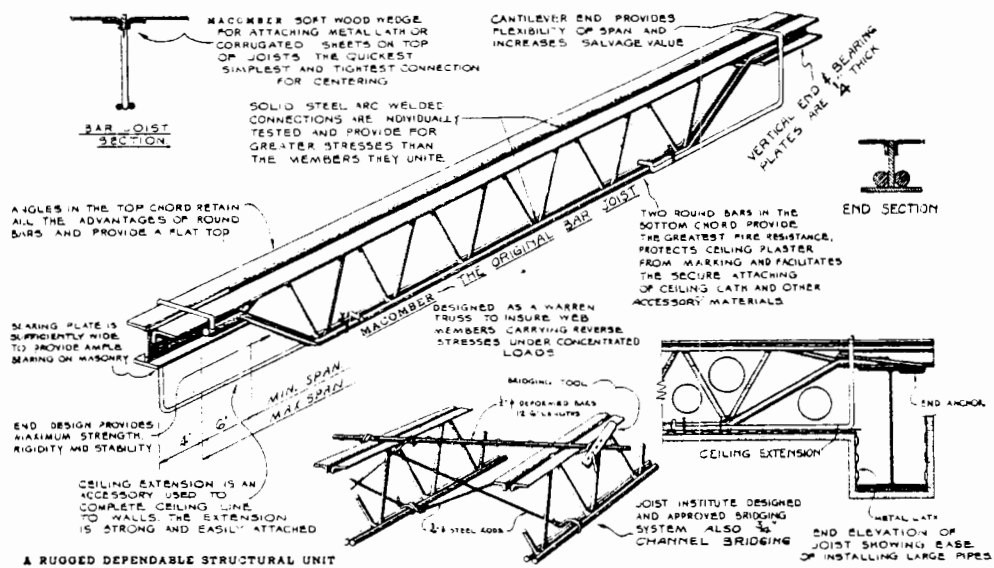
JOIST SIZE	NOMINAL DEPTH	RESISTING MOMENTS IN INCH POUNDS	MAXIMUM END REACTION IN POUNDS	SPAN IN FEET																						JOIST SIZE							
				4-0	5-0	6-0	7-0	8-0	9-0	10-0	11-0	12-0	13-0	14-0	15-0	16-0	17-0	18-0	19-0	20-0	21-0	22-0	23-0	24-0	25-0		26-0	27-0	28-0	29-0	30-0	31-0	32-0
81	8	29,500	1600	800	640	530	402	308	243	197	162	137	116	100	87	77																	81
82	8	52,500	1900					475	422	350	289	243	207	178	155	137																82	
102	10	63,000	1900					475	422	380	345	292	248	214	187	164	145	130	116	105												102	
103	10	82,000	1950					487	433	390	354	325	300	278	243	213	189	169	151	137												103	
104	10	100,000	2200					550	488	440	400	366	338	314	293	260	230	205	184	167												104	
123	12	92,000	2200					440	400	366	338	312	272	240	212	189	170	153	139	127	116	106										123	
124	12	115,000	2300					460	418	383	353	328	306	287	265	236	212	192	174	158	145	133										124	
125	12	142,000	2500					500	454	416	384	357	333	312	294	277	262	237	215	196	179	164										125	
126	12	175,000	2700					540	490	450	415	385	360	337	317	300	284	270	257	241	221	202										126	
145	14	156,000	2900									483	446	414	386	362	341	320	288	260	236	215	197	180	166	154	143	133				145	
146	14	205,000	3100									516	476	442	413	387	364	344	326	310	295	287	258	237	218	202	187	174				146	
147	14	246,000	3400									566	523	485	455	425	400	377	357	340	323	309	295	283	262	243	225	209				147	
166	16	232,000	3200									533	492	457	426	400	376	355	320	304	290	278	266	247	229	212	197	184	172	161	151	166	
167	16	281,000	3600									600	553	514	480	450	423	400	378	360	342	327	313	300	288	276	257	239	223	208	195	183	167

MACOMBER

STEEL JOISTS

2

A RUGGED DEPENDABLE STRUCTURAL UNIT FOR
THE BUILDING OF FIREPROOF FLOORS



MACOMBER
INCORPORATED
CANTON • OHIO

SPECIAL

**STEEL JOISTS
NAILER JOISTS
LONGSPAN JOISTS
ROOF PURLINS**

BY

MACOMBER

MACOMBER U. S. PATENT NOS. COVERING STEEL JOISTS
1651013 - 1614248 - 1614247 - 1614249 AND OTHERS

**PROPERTIES
AND
DETAILS**

Part of the Macomber Line
of
Standard Steel Building Products

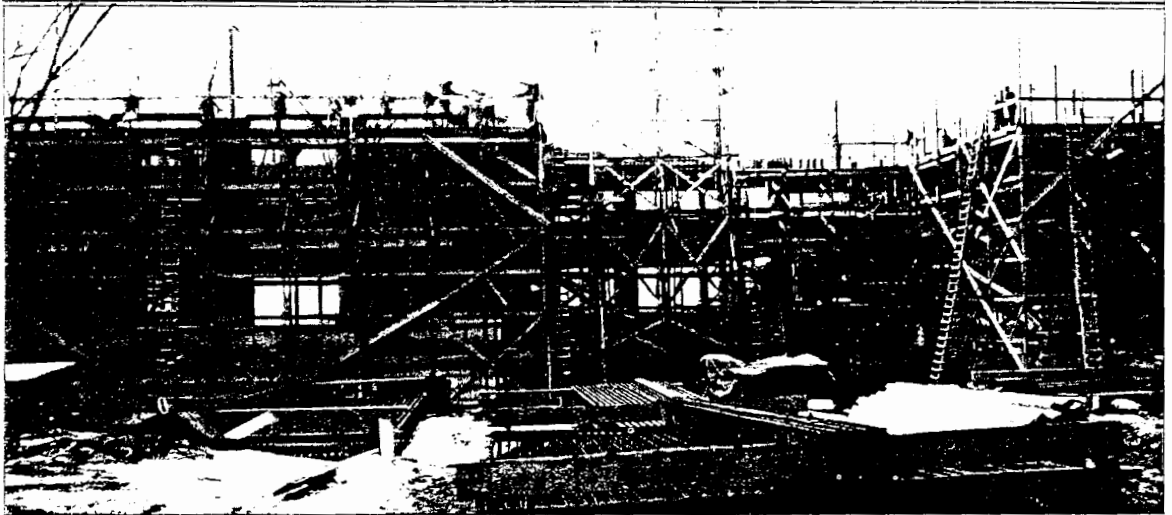
MACOMBER

INCORPORATED

CANTON • OHIO

STEEL JOISTS

BY
MACOMBER



*This Two Million Dollar School Is One of the Finest in
New England*

Senior High School, Pawtucket, R. I.
Robert Mickle and Robert Manahan, *Archts.*
Peter C. Cruise, *Contr.*

SPECIAL STEEL JOISTS

BY

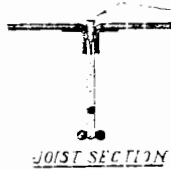
MACOMBER

There are special requirements for Steel Joists which can be more economically and practically filled by lighter joists for a given depth than those standardized by the Steel Joist Institute.

In addition there is a gap between the Standard Steel Joist with maximum depth of 16" and the Standard Longspan Joist with minimum depth of 20". For this range joists are required which are so designed as to function with either the Steel Joists or the Longspan Joists.

This folder shows all properties and data of these special range joists as standardized in design and manufacture by Macomber. The design of these joists is in accordance with the engineering standards of the American Institute of Steel Construction and the Steel Joist Institute. The resisting moments as shown are developed within these limitations and are the basis of the loading tables.

MACOMBER STEEL JOIST



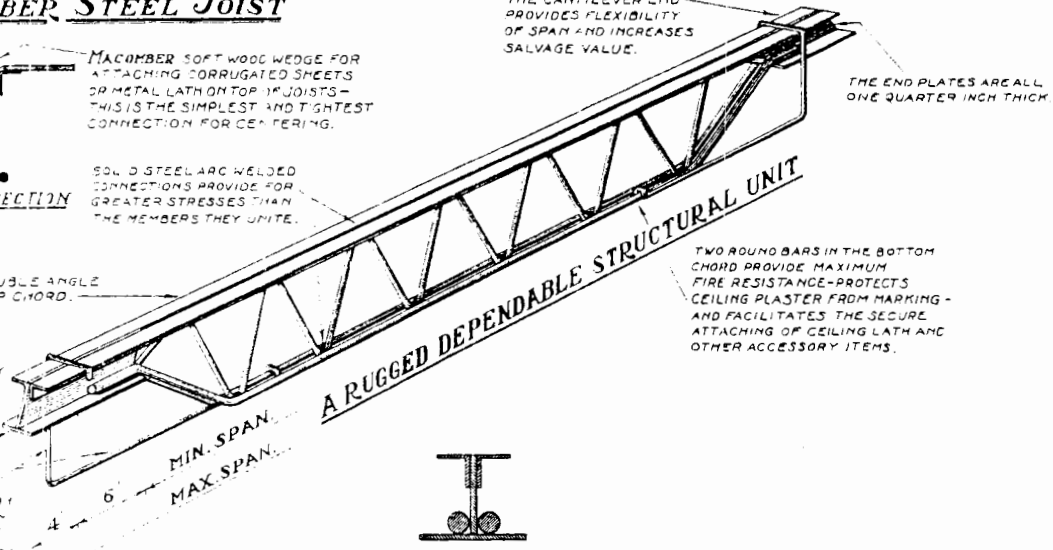
MACOMBER SOFT WOOD WEDGE FOR ATTACHING CORRUGATED SHEETS OR METAL LATH ON TOP OF JOISTS - THIS IS THE SIMPLEST AND TIGHTEST CONNECTION FOR CENTERING.

SOLID STEEL ARC WELDED CONNECTIONS PROVIDE FOR GREATER STRESSES THAN THE MEMBERS THEY UNITE.

DOUBLE ANGLE TOP CHORD.

THE BEARING PLATE IS ONE QUARTER INCH THICK AND SUFFICIENTLY WIDE TO PROVIDE AMPLE BEARING ON MASONRY.

THE CEILING EXTENSION IS AN ACCESSORY ITEM USED TO COMPLETE THE CEILING LINE TO WALL.



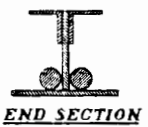
THE CANTILEVER END PROVIDES FLEXIBILITY OF SPAN AND INCREASES SALVAGE VALUE.

THE END PLATES ARE ALL ONE QUARTER INCH THICK.

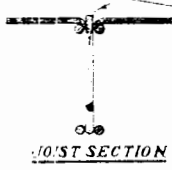
A RUGGED DEPENDABLE STRUCTURAL UNIT

TWO ROUND BARS IN THE BOTTOM CHORD PROVIDE MAXIMUM FIRE RESISTANCE - PROTECTS CEILING PLASTER FROM MARKING - AND FACILITATES THE SECURE ATTACHING OF CEILING LATH AND OTHER ACCESSORY ITEMS.

MIN. SPAN
MAX. SPAN



MASSILLON STEEL JOIST



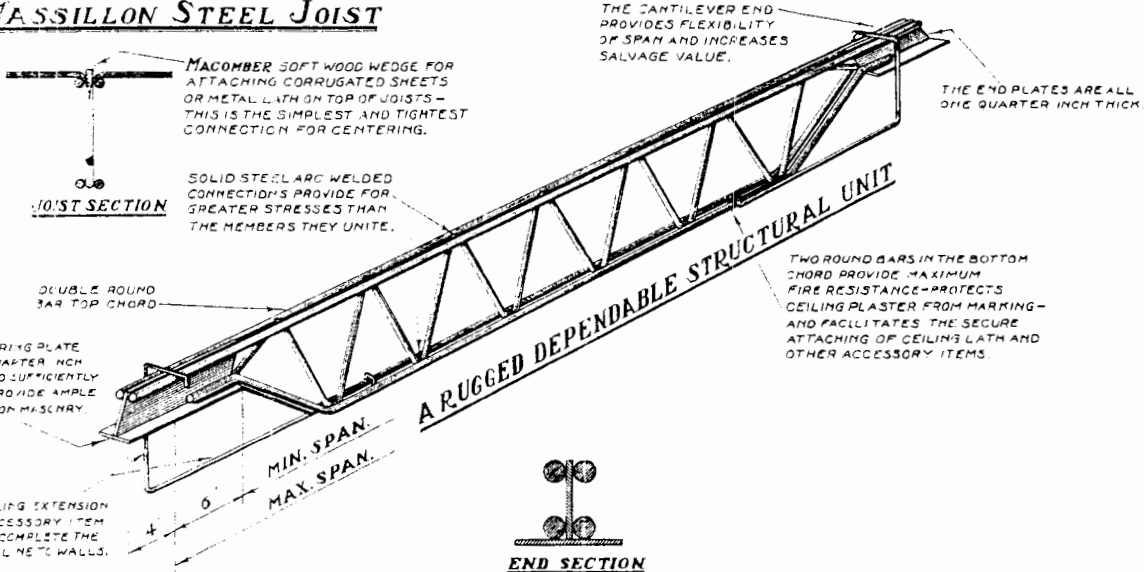
MACOMBER SOFT WOOD WEDGE FOR ATTACHING CORRUGATED SHEETS OR METAL LATH ON TOP OF JOISTS - THIS IS THE SIMPLEST AND TIGHTEST CONNECTION FOR CENTERING.

SOLID STEEL ARC WELDED CONNECTIONS PROVIDE FOR GREATER STRESSES THAN THE MEMBERS THEY UNITE.

DOUBLE ROUND BAR TOP CHORD.

THE BEARING PLATE IS ONE QUARTER INCH THICK AND SUFFICIENTLY WIDE TO PROVIDE AMPLE BEARING ON MASONRY.

THE CEILING EXTENSION IS AN ACCESSORY ITEM USED TO COMPLETE THE CEILING LINE TO WALL.



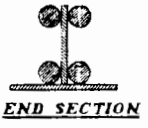
THE CANTILEVER END PROVIDES FLEXIBILITY OF SPAN AND INCREASES SALVAGE VALUE.

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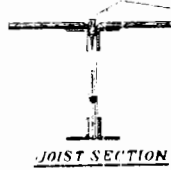
A RUGGED DEPENDABLE STRUCTURAL UNIT

TWO ROUND BARS IN THE BOTTOM CHORD PROVIDE MAXIMUM FIRE RESISTANCE - PROTECTS CEILING PLASTER FROM MARKING - AND FACILITATES THE SECURE ATTACHING OF CEILING LATH AND OTHER ACCESSORY ITEMS.

MIN. SPAN
MAX. SPAN



CANTON STEEL JOIST



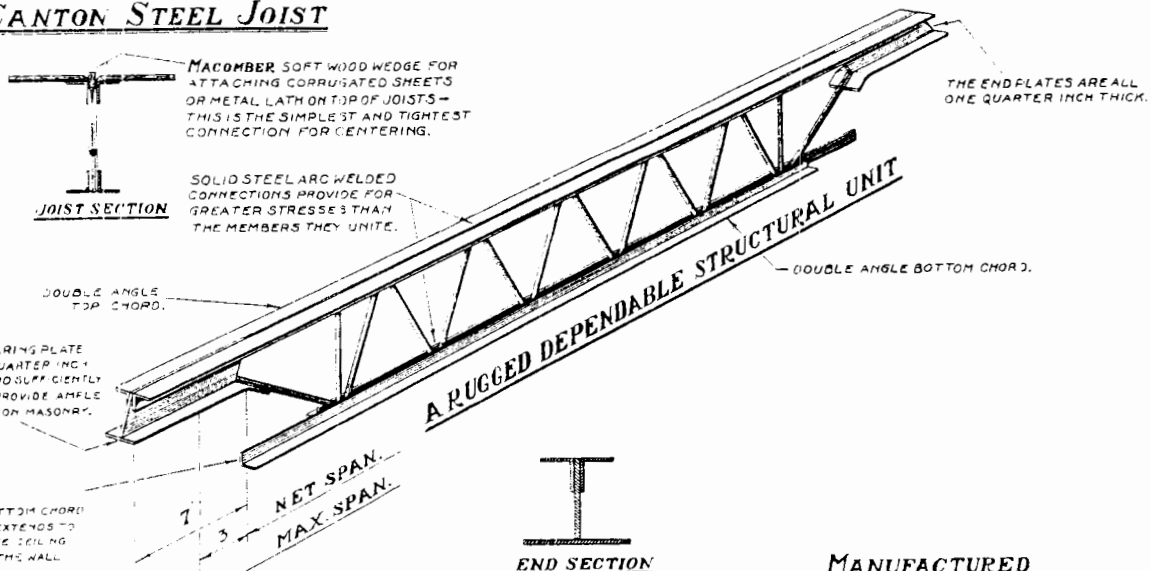
MACOMBER SOFT WOOD WEDGE FOR ATTACHING CORRUGATED SHEETS OR METAL LATH ON TOP OF JOISTS - THIS IS THE SIMPLEST AND TIGHTEST CONNECTION FOR CENTERING.

SOLID STEEL ARC WELDED CONNECTIONS PROVIDE FOR GREATER STRESSES THAN THE MEMBERS THEY UNITE.

DOUBLE ANGLE TOP CHORD.

THE BEARING PLATE IS ONE QUARTER INCH THICK AND SUFFICIENTLY WIDE TO PROVIDE AMPLE BEARING ON MASONRY.

ONE BOTTOM CHORD ANGLE EXTENDS TO COMPLETE CEILING LINE TO THE WALL.



THE END PLATES ARE ALL ONE QUARTER INCH THICK.

A RUGGED DEPENDABLE STRUCTURAL UNIT

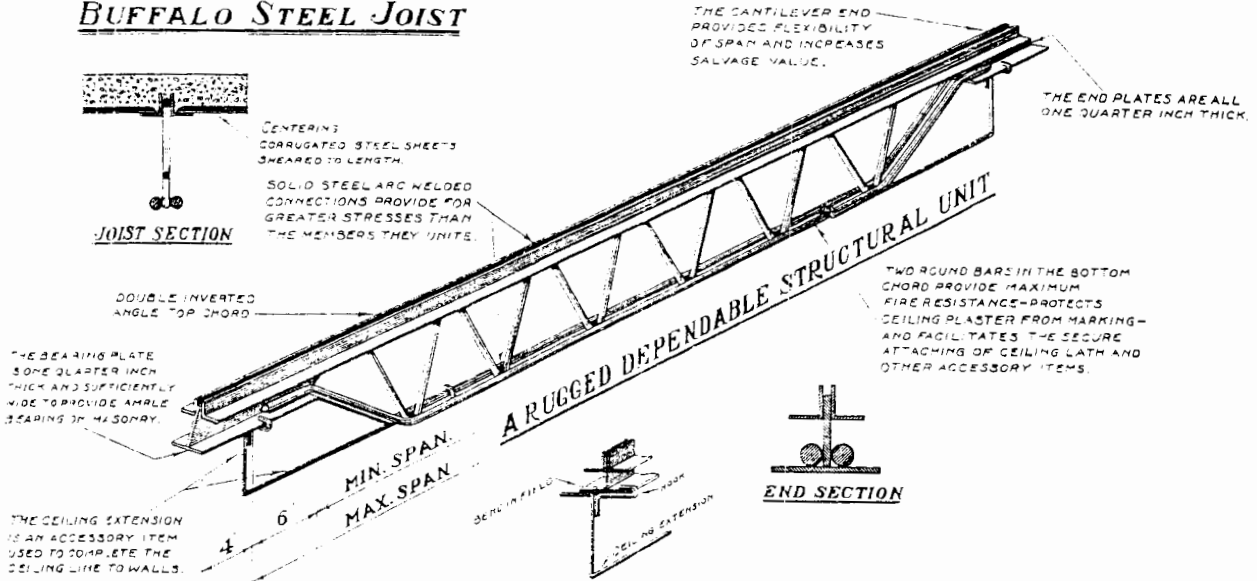
DOUBLE ANGLE BOTTOM CHORD.

NET SPAN
MAX. SPAN

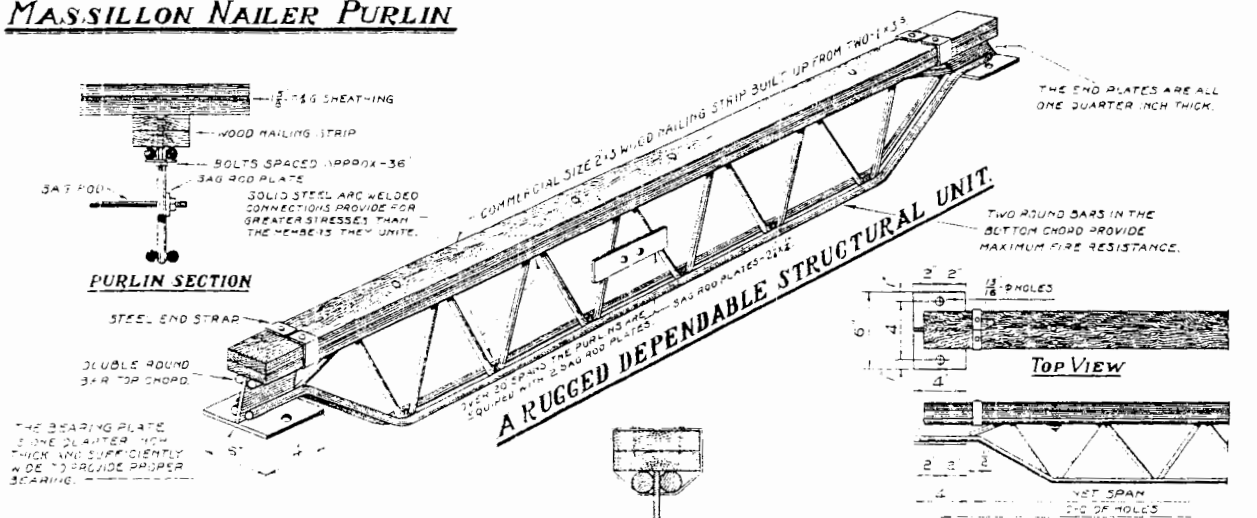


MANUFACTURED
By
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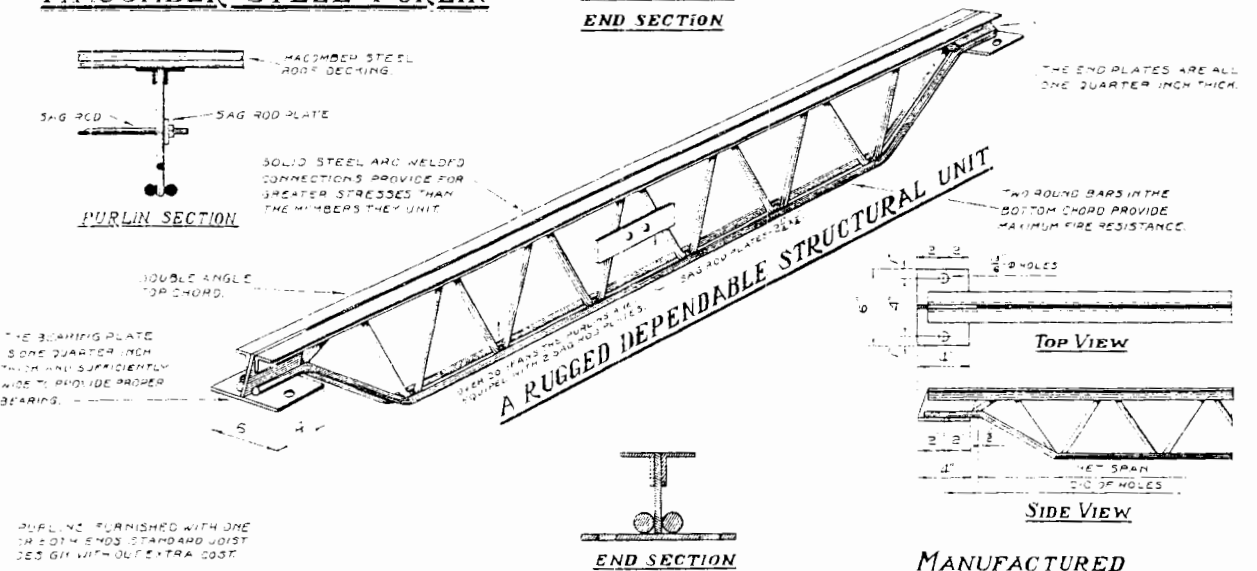
BUFFALO STEEL JOIST



MASSILLON NAILER PURLIN

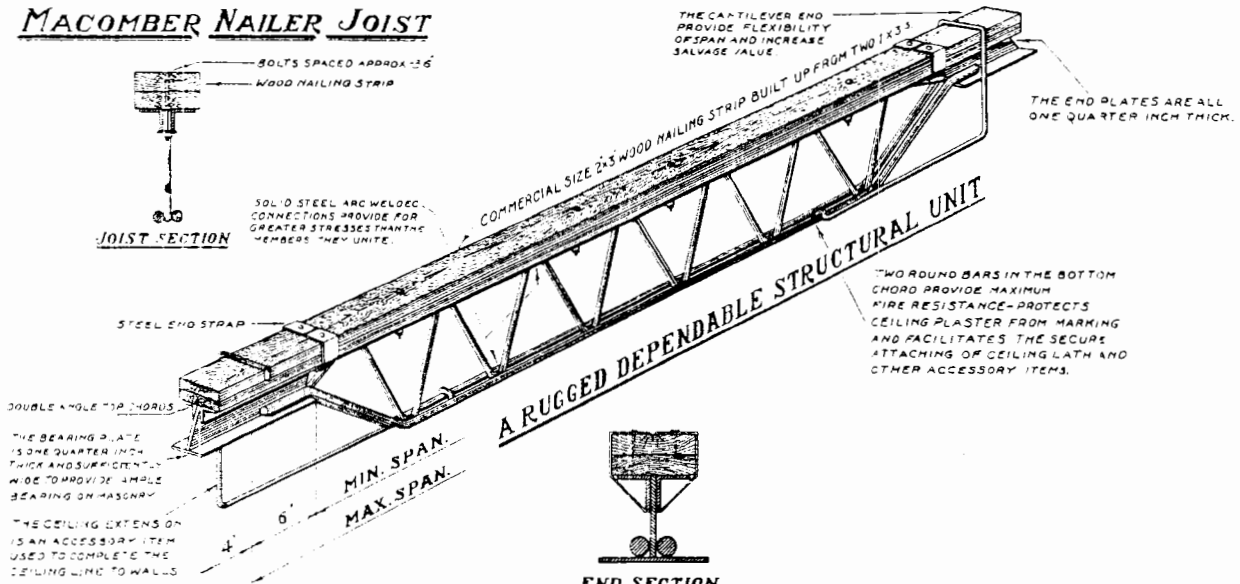


MACOMBER STEEL PURLIN

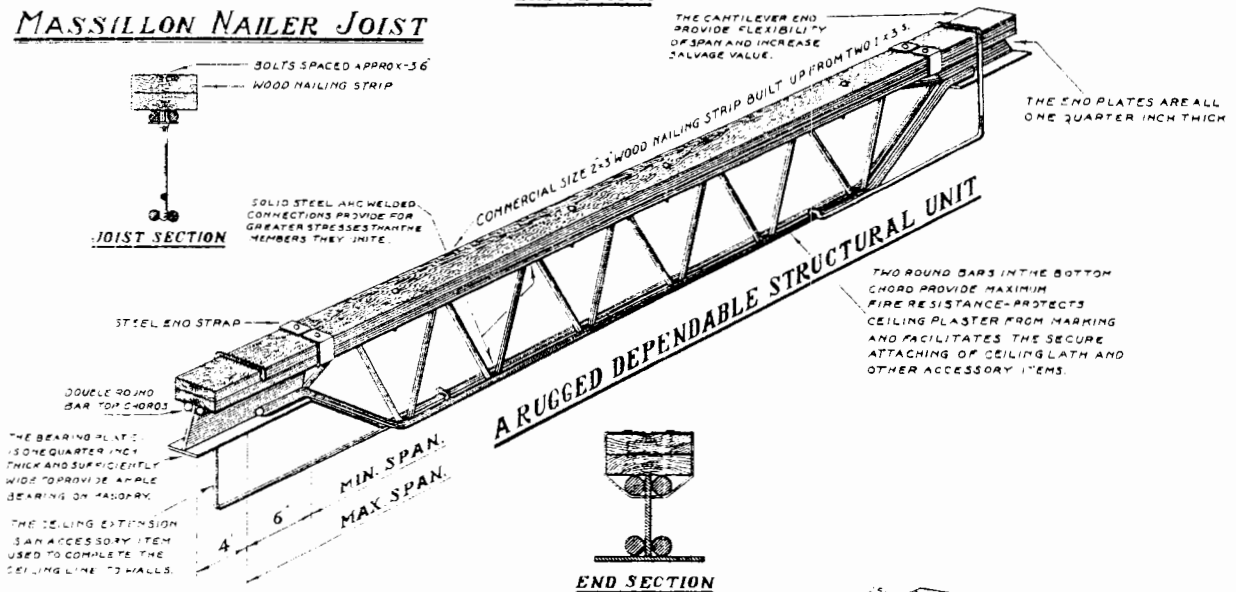


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CANTON, OHIO.

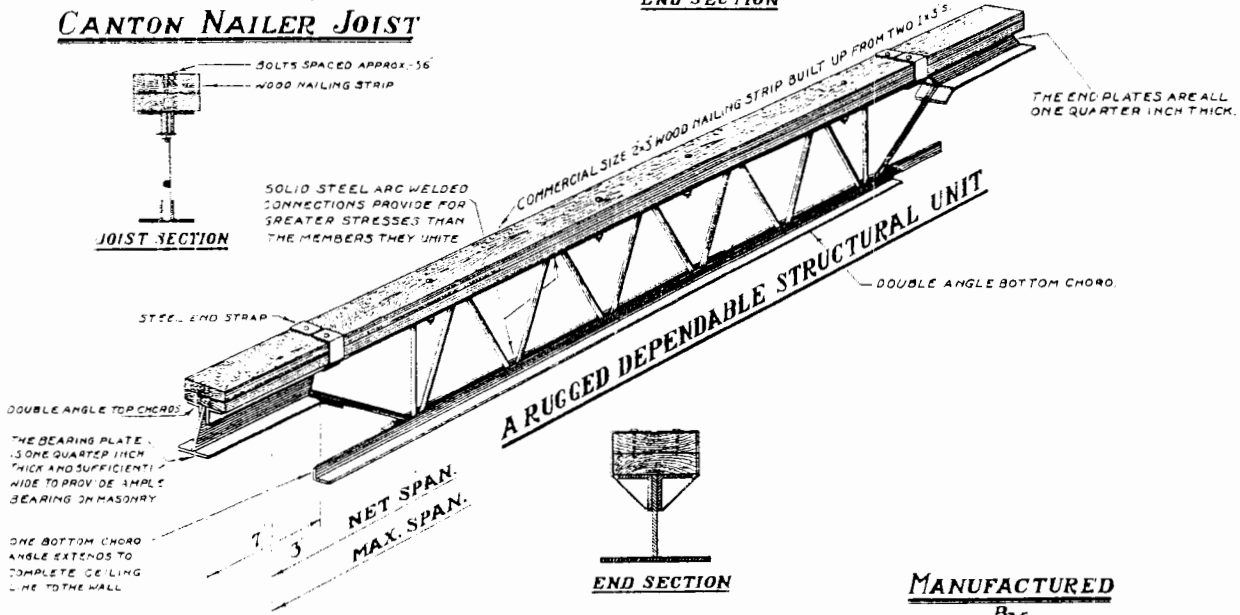
MACOMBER NAILER JOIST



MASSILLON NAILER JOIST



CANTON NAILER JOIST



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CANTON, OHIO.

MACOMBER LONGSPAN JOISTS

DESCRIPTION OF STYLES

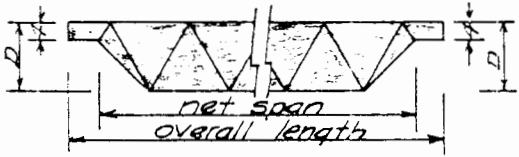


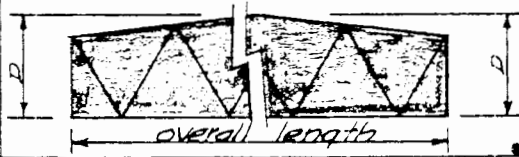

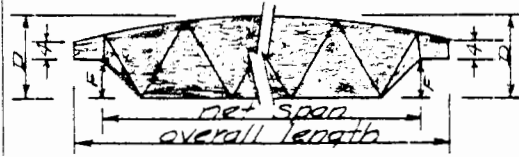

ALL SPECIAL LONGSPAN JOISTS are designed as to section sizes as shown in this pamphlet for any given size. Longspan Joists are however specially detailed for each installation and may be purchased in any of the styles shown below. The Longspan Joist Standard Underslung End depth is 4" instead of the 2-1/2" end depth for Steel Joists.

The SPECIAL LONGSPAN JOIST web system is all round bars - Warren Truss design - while the STANDARD LONGSPAN JOIST web system is all angles - Pratt Truss design. In determining the carrying capacity of Longspan Joists of any style refer to the loading table in this pamphlet

and use the center depth of the Joist. All Longspan Joists are fitted with ample bearings.

The SPECIAL LONGSPAN JOIST standardized design as shown in this pamphlet considers compression stresses only in the top chords. Where bending stress between panel points is to be considered in the top chord development, then add 5% to the listed weight and 5% to the listed price f.o.b. Canton, Ohio.

Macomber Longspan Joists do not require punching of top chords for attaching nailing strips. There is ample space at center of chord for placing bolts.

STYLE NUMBER	STYLE NAME	STYLE OUTLINE	DESCRIPTION
1	STANDARD UNDERSLUNG		STANDARD UNDERSLUNG LONGSPAN JOISTS Top chord is flat. End depth is 4".
2	CENTER SLOPE UNDERSLUNG		CENTER SLOPE UNDERSLUNG LONGSPAN JOISTS Top chord is sloped to the center. Standard slope is 1/4" to the foot. End depth is 4". Carrying capacity is determined by center depth.
3	STANDARD SQUARE END		STANDARD SQUARE END LONGSPAN JOIST Top and bottom chords are flat and parallel.
4	CENTER SLOPE SQUARE END		CENTER SLOPE SQUARE END LONGSPAN JOISTS Top chord is sloped to the center. Standard slope is 1/4" to the foot. Carrying capacity is determined by the center depth.
5	FULL SLOPE SQUARE END		FULL SLOPE SQUARE END LONGSPAN JOISTS Top chord is sloped full length of the joist. Standard slope is 1/4" to the foot. Carrying capacity is determined by the center depth.
6	CURVED CHORD UNDERSLUNG		CURVED CHORD UNDERSLUNG LONGSPAN JOISTS Top chord is curved. Center depth is E plus about 10% of the span. Carrying capacity is determined by the center depth.
7	CURVED CHORD SQUARE END		CURVED CHORD SQUARE END LONGSPAN JOISTS Top chord is curved. Center depth is E plus about 10% of the span. Carrying capacity is determined by the center depth.

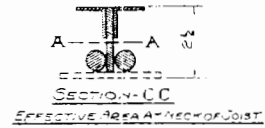
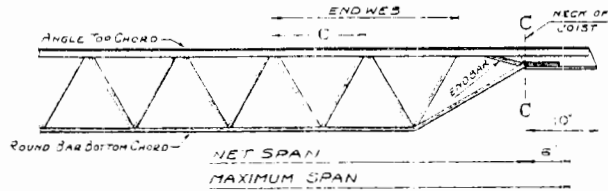
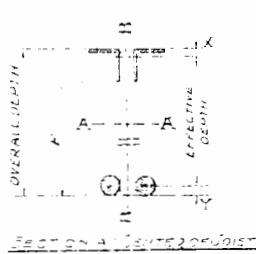
DESIGN DATA SPECIAL STEEL JOISTS

Detail information shown on opposite page

DESIGN DATA MACOMBER STEEL JOIST MANUFACTURED BY MACOMBER INCORPORATED CANTON, OHIO

In Macomber Steel Joists note the heavy, solid end sections - the lateral bracing - the wide bearing plates - the end cap and the inherent flexibility consistent with design metal in the bottom chords. All details combine to provide a rugged, tenable section which will function as a steel joist should.

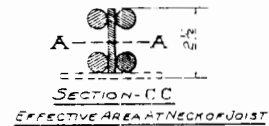
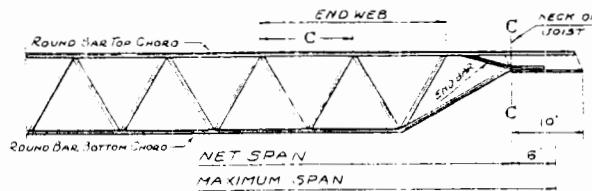
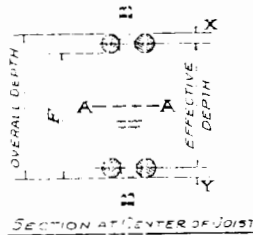
In the manufacture of Macomber Steel Joists there is no distortion of metal in forming parts. All connections are made by electric arc welding. The area of welds is several times the requirement and the welds are adapted to positive inspection. The design and loading table are in accordance with established engineering standards.



DESIGN DATA MASSILLON STEEL JOIST MANUFACTURED BY MACOMBER INCORPORATED CANTON, OHIO

In Massillon steel joists note the heavy, solid end sections - the wide bearing plates - the end cap and the inherent flexibility consistent with design metal in bottom chords, round bar top and bottom chord sections, the high lateral bracing and facilitate attaching necessary details. All details combine to provide a rugged, tenable section which will function as a steel joist should.

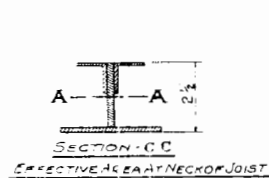
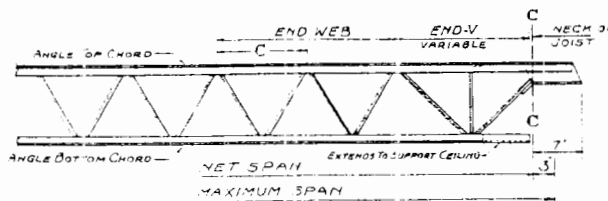
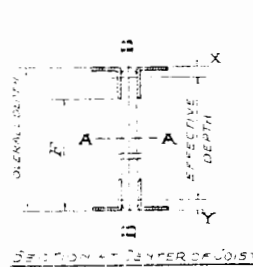
In the manufacture of Massillon Steel Joists there is no distortion of metal in forming parts. All connections are made by electric arc welding. The area of welds is several times the requirement and the welds are adapted to positive inspection. The design and loading table are in accordance with established engineering standards.



DESIGN DATA CANTON STEEL JOIST MANUFACTURED BY MACOMBER INCORPORATED CANTON, OHIO

In Canton steel joists note the heavy, solid end sections and the wide bearing plates. The angle bottom chord extends to facilitate the use of ceiling extensions. All details combine to provide a rugged, tenable section which will function as a steel joist should.

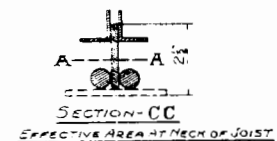
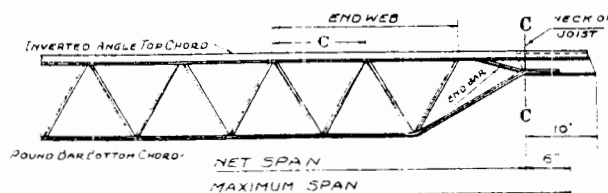
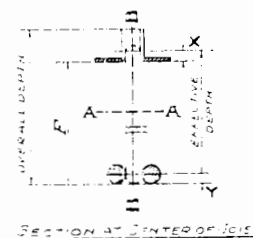
In the manufacture of Canton Steel Joists, there is no distortion of metal in forming parts. All connections are made by electric arc welding. The area of welds is several times the requirement and the welds are adapted to positive inspection. The design and loading table are in accordance with established engineering standards.



DESIGN DATA BUFFALO STEEL JOIST MANUFACTURED BY MACOMBER INCORPORATED CANTON, OHIO

In the Buffalo steel joists note the heavy, solid end section - the wide bearing plates - the arrangement of top chord ends as for placement in concrete floor slab and the maximum thickness limited by stress requirements of plate in bottom chords. All details combine to provide a rugged, tenable section which will function as a steel joist should.

In the manufacture of Buffalo Steel Joists there is no distortion of metal in forming parts. All connections are made by electric arc welding. The area of welds is several times the requirement and the welds are adapted to positive inspection. The design and loading table are in accordance with established engineering standards.



Loading Tables are Based on Resisting Moments as shown

DESIGN DATA SPECIAL NAILER JOISTS

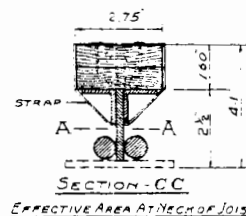
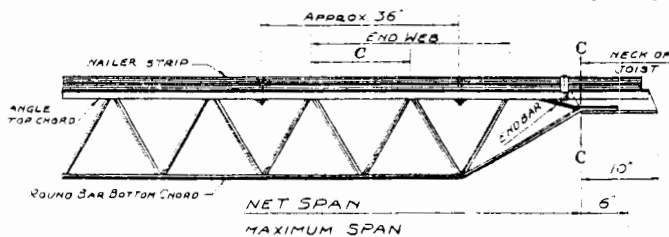
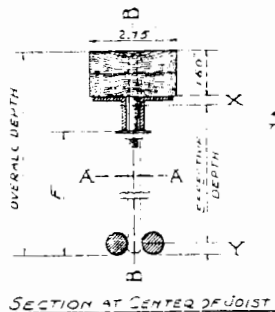
Detail information shown on opposite page

MACOMBER NAILER JOIST

In Macomber Nailer Joists note the heavy, solid end sections - the separate - extra wide - bearing plates - top and bar and the thickest possible consistent with design metal in the bottom chords. All details combine to provide a rugged, dependable section which will function as a steel joist should.

Top Chord - Angles
Bottom Chord - Bars

In the manufacture of Macomber Nailer Joists there is no distortion of metal in forming parts. All connections are made by electric arc welding. The area of welds is several times the requirement and the welds are adapted to positive inspection. The design and loading table are in accordance with established engineering standards.



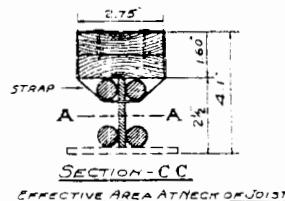
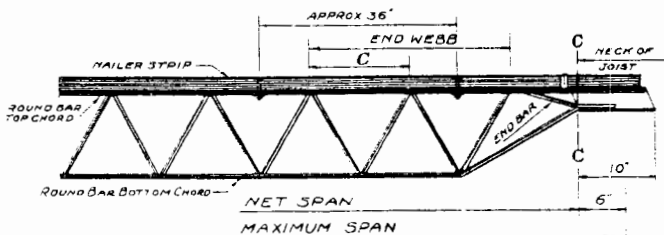
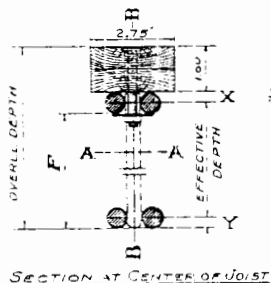
The 2by1 wood strip is built up of two pieces of commercial size 1by1. This lamination increases the quality of the strip and the lateral rigidity of the joists. The strip is attached with bolts and strapped at the ends.

MASSILLON NAILER JOIST

In Massillon Nailer Joists note the heavy, solid end sections - the wide bearing plates - the end bar and the thickest possible consistent with design metal in the bottom chords. Round bar top and bottom chord sections give high lateral rigidity and facilitate attaching accessory items. All details combine to provide a rugged, dependable section which will function as a steel joist should.

Top Chord - Bars
Bottom Chord - Bars

In the manufacture of Massillon Nailer Joists there is no distortion of metal in forming parts. All connections are made by electric arc welding. The area of welds is several times the requirement and the welds are adapted to positive inspection. The design and loading tables are in accordance with established engineering standards.



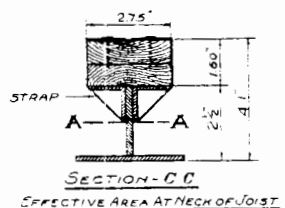
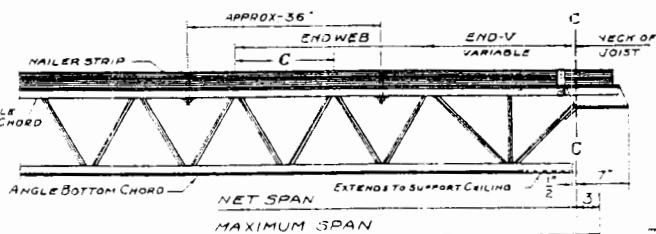
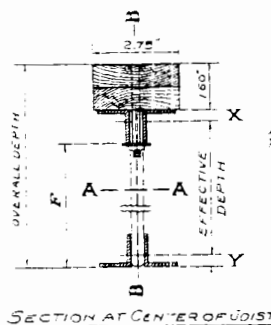
The 2by1 wood strip is built up of two pieces of commercial size 1by1. This lamination increases the quality of the strip and the lateral rigidity of the joists. The strip is attached with bolts and strapped at the ends.

CANTON NAILER JOIST

In Canton Nailer Joists note the heavy, solid end sections and the wide bearing plates. The angle bottom chord extends to eliminate the need of ceiling extensions. All details combine to provide a rugged, dependable section which will function as a steel joist should.

Top Chord - Angles
Bottom Chord - Angles

In the manufacture of Canton Nailer Joists there is no distortion of metal in forming parts. All connections are made by electric arc welding. The area of welds is several times the requirement and the welds are adapted to positive inspection. The design and loading table are in accordance with established engineering standards.



The 2by1 wood strip is built up of two pieces of commercial size 1by1. This lamination increases the quality of the strip and the lateral rigidity of the joists. The strip is attached with bolts and strapped at the ends.

The design of Macomber Special Nailer Joists is in accordance with the engineering standards of all recognized authorities. Loading Tables are based on Resisting Moments as shown.

MANUFACTURED
By
MACOMBER INCORPORATED
CANTON, OHIO.

SPECIAL

- STEEL JOISTS
- NAILER JOISTS
- LONGSPAN JOISTS
- ROOF PURLINS

The design of all Special Joist sections as Manufactured by Macomber are in accordance with the Engineering standards of The American Institute of Steel Construction and The Steel Joist Institute.

SPECIAL

- STEEL JOISTS
- NAILER JOISTS
- LONGSPAN JOISTS
- ROOF PURLINS

This loading Table shows the total loading capacity in pounds per linear foot for all Special Steel Joists, Nailer Joists, Purlins and Longspan Joists as Manufactured by Macomber.

MACOMBER INCORPORATED

CANTON, OHIO.

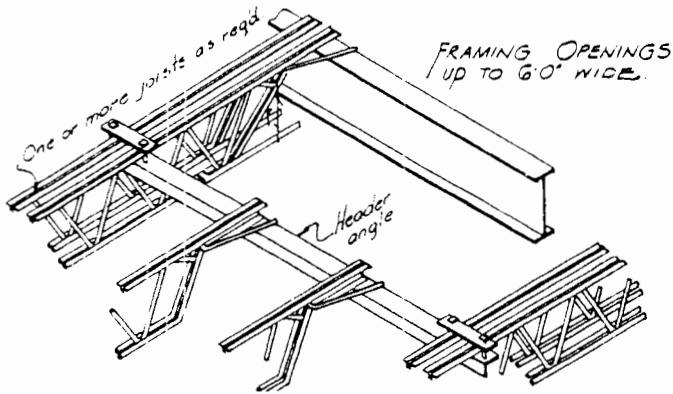
STANDARD PROPERTIES AND ALLOWABLE TOTAL LOADS IN POUNDS PER LINEAR FOOT FOR SPECIAL JOIST SECTIONS AS MANUFACTURED BY MACOMBER

TOTAL SAFE LOADING CAPACITY PER LINEAR FOOT

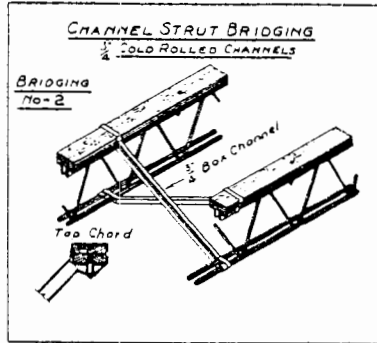
JOIST SIZE	RESISTING MOMENTS IN INCH POUNDS	MAXIMUM END REACTION IN POUNDS	SPAN IN FEET																JOIST SIZE																				
			8-0	9-0	10-0	11-0	12-0	13-0	14-0	15-0	16-0	17-0	18-0	19-0	20-0	21-0	22-0	23-0		24-0	25-0	26-0	27-0	28-0	29-0	30-0	31-0	32-0	33-0	34-0	35-0	36-0	37-0	38-0	39-0	40-0			
122	80500	2100	525	467	420	382	350	318	274	238	210	186	166	149	134	122	111	101	93																				
143	115000	2700			540	491	450	415	386	341	299	265	237	212	192	174	158	145	133	123	113	105	98																
144	142000	2800			560	509	467	431	400	373	350	328	292	262	237	215	196	179	164	151	140	130	121																
163	132000	2750					458	423	393	367	344	304	272	244	220	200	182	166	153	141	130	121	112	105	98														
164	162000	2900					483	446	414	387	363	341	322	299	270	245	223	204	187	173	160	148	138	128	120														
165	197000	3000					500	462	429	400	375	353	316	286	271	248	228	210	194	180	168	156	146	137	128														
168	340500	4000					667	615	571	533	500	471	444	421	400	381	364	348	333	320	308	296	286	270	252	236	222												
186	263000	3400								475	400	378	358	340	324	309	296	283	272	259	241	224	208	195	183	171	161	152	143										
187	319000	3800								415	447	422	400	380	367	345	330	317	304	292	281	271	253	236	221	208	195	184	174										
188	383000	4200								575	494	461	442	420	400	382	365	350	336	323	311	300	289	280	266	249	234	221	208	197									
207	355500	4100												410	390	373	357	342	328	315	304	293	282	263	247	231	218	205	193	183									
208	425500	4400													440	419	400	383	367	352	338	326	314	303	293	284	275	260	245	232	219	207	196	187	177				

THIS LOADING TABLE APPLIES TO ALL SPECIAL JOISTS AS MANUFACTURED BY MACOMBER. THE LOADING CAPACITY IS THE SAME FOR THE STEEL JOISTS-NAILER JOISTS-ROOF PURLINS AND LONGSPAN JOISTS IN THE SPECIAL CLASSIFICATION.

CONSTRUCTION DETAILS

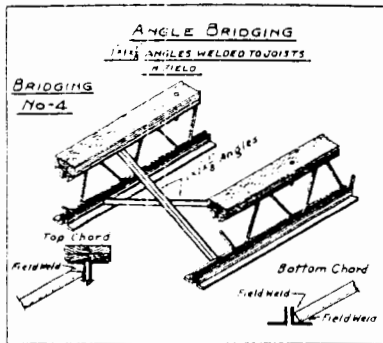


MACOMBER NAILER JOISTS and 3/4" Channel Bridging

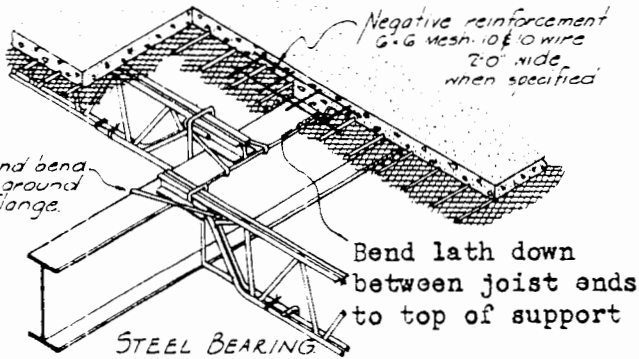
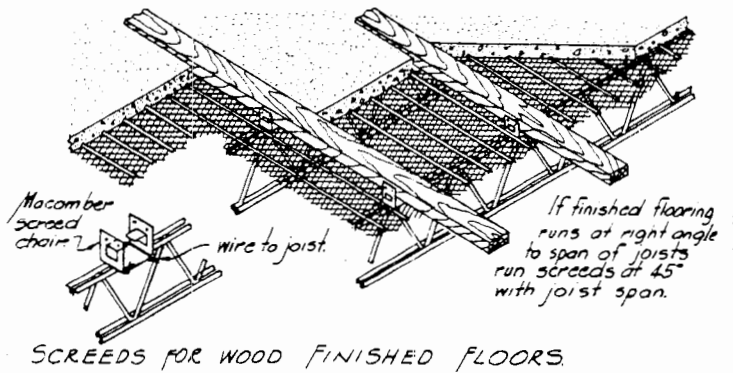


All Nailer Joists made by Macomber have a 2" x 3" commercial size laminated wood nailing strip.

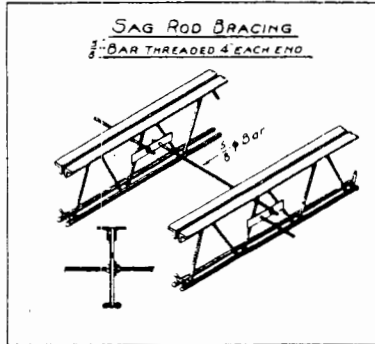
CANTON NAILER JOIST and Welded Angle Bridging



The laminated wood nailing strip on all Nailer Joists made by Macomber increases the quality of the strip and lateral rigidity of the joist.

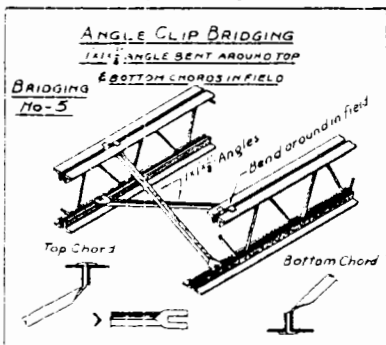


MACOMBER ROOF PURLINS and Sag Rod Bracing



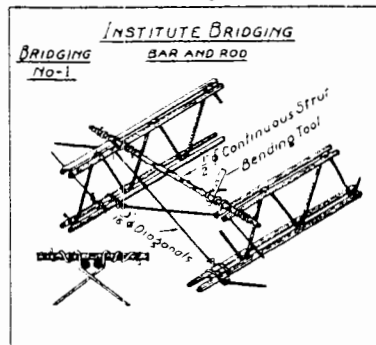
For wider spacing of Purlins or joists use sag rod bracing. Purlins are of the Steel Joist or the Nailer Joist type.

CANTON STEEL JOIST and Angle Clip Bridging



The Canton Steel Joist has two angle sections in both the top and bottom chords.

MASSILLON STEEL JOIST and Institute Bridging



The Massillon Steel Joist has two round bars in both the top and bottom chords.

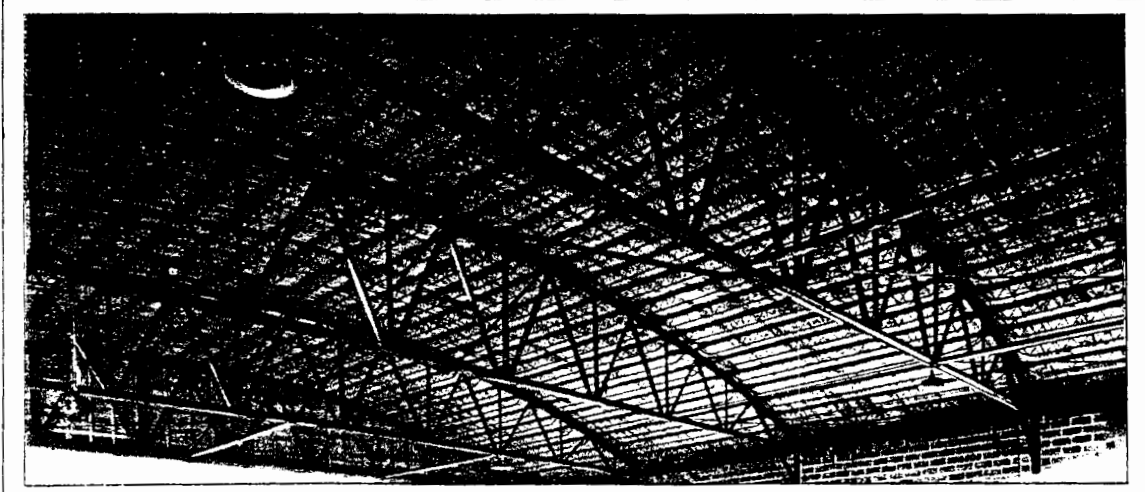
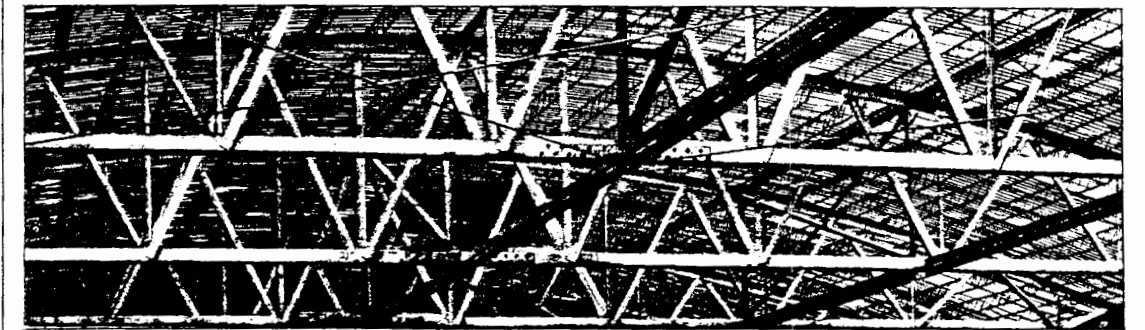
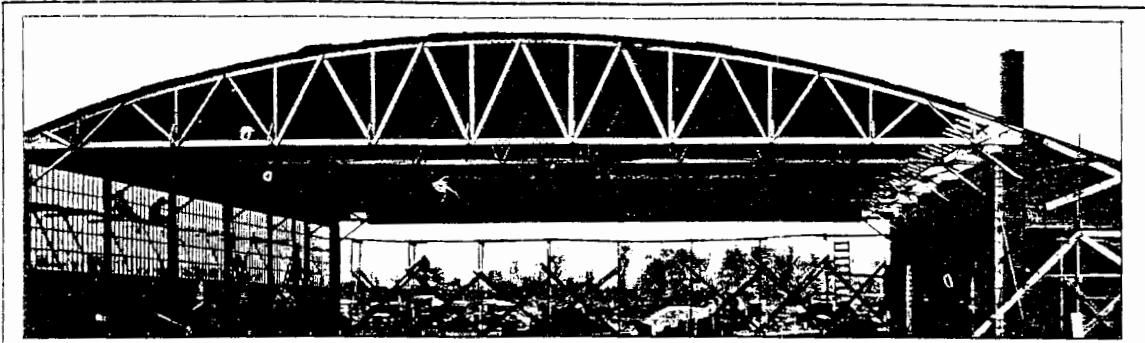
Steel Joist Purlins

Nailer Joist Purlins

STEEL ROOF TRUSSES

BY

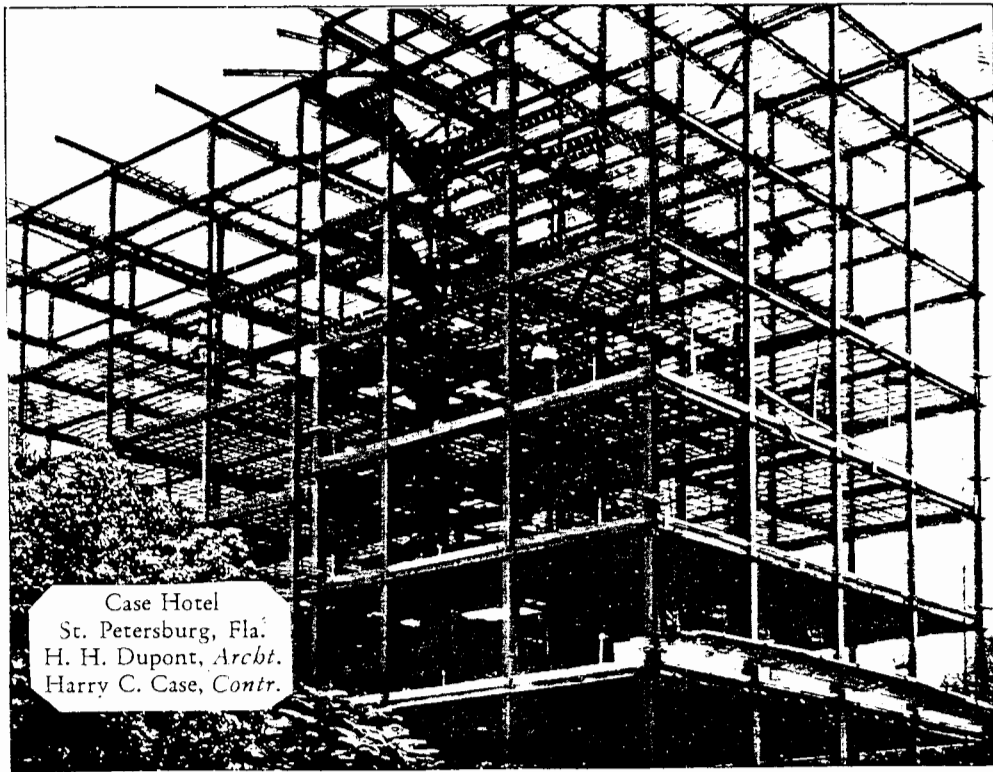
M A C O M B E R



STEEL JOISTS

BY

MACOMBER



Case Hotel
St. Petersburg, Fla.
H. H. Dupont, *Archt.*
Harry C. Case, *Contr.*

MACOMBER RESIDENCE JOISTS

GENERAL INFORMATION

SAFE LOADING TABLES

One of the Macomber Line
of
Standard Steel Building Products

MACOMBER
INCORPORATED
CANTON • OHIO

MACOMBER RESIDENCE JOISTS

The function of Macomber Residence Joists is to provide for the economical installation of semi-fireproof floors in homes or other similar live load occupancies. The joist is designed for this loading condition. The dead weight of the finished floor settles the joist into position with the elimination of springness and the safe carrying capacity is predetermined with accuracy.

This joist is a scientifically designed and properly developed shop fabricated unit for the construction of Residence floors. It can be installed by the carpentry trade with carpenters' tools.

This joist utilizes the best properties and characteristics of wood and steel by the intelligent application of each material in a combination design. The result is a floor joist which is adaptable to standard building practice and makes available for the home the advantages and the protection of modern floor construction at a low cost.

The floor is constructed in the ordinary manner by nailing directly on the joists a sub-flooring as a base for the selected type of finished wood flooring. The ceiling is finished by attaching metal lath to the bottom chords of the joist as a base for the ceiling plaster or as shown in the details - such other type of ceiling finish as may be selected.

The result is a fire resisting ceiling construction and a floor detail which necessitates the transfer of high temperatures through dead air space insulation clear to the top of the slab for any deterioration in carrying capacity. Most fires in homes start in the basement and rarely is enough heat generated to cause any structural damage to this floor.

Some advantages gained by using Macomber Residence Joists -

- Accurately known carrying capacity and consistent quality.
- Freedom from shrinkage with resulting protection to plaster throughout the structure.
- Fire Resistance.
- Decrease in deflection under loading and minimizing of vibration.
- Measurable protection against the inroads of termites.
- Saving in headroom by installing piping and ducts in floor construction. Without decreasing the strength of the floor.
- Availability of wider range of spans with resulting economy and greater freedom in floor planning.

Taking into account the superiority of the floor - the adaptability of the joist to any type of wall supports and framing - the opportunity for better and more direct installation of plumbing - heating - ventilating - water supply and lighting equipment - the known strength capacity of the joists and simple method for applying any kind of finish materials the advantages sum up to -

Economy - Durability and Superiority and these are not just words as in the final analysis the result is Pride and Satisfaction in ownership.

The floor joist is an unseen, unthought of part of the building but the effect of this one item on the structure is all out of proportion to its relative cost. Good floor joists pay big dividends in any structure.

Some special features in the detail of Macomber Residence Joists -

- A built up laminated wood top chord of selected material.
- Thickness of metal - none of the bars are less than 3/8" thick. This provides sturdiness - stability and resistance to all elements of destruction.
- Solid arc welded connections which are stronger than the members they unite.
- A design of section resulting in high lateral rigidity.
- A web design which insures capacity for reverse stresses and the supporting of concentrated loads.
- Panel point spacing to permit the maximum latitude in pipe installation.
- Cantilever ends which give each standard joist a span flexibility of six inches. This standard feature gives greater economy and flexibility.
- A workable section which may be shortened as to overall length on the job by cutting with an ordinary hand wood saw. It can be nailed to supports and in every way it is fitted and placed with the use of ordinary wood working tools.

The Macomber Residence Joist is built by the originator of the open web joists. It embodies the advantages of the Macomber Bar Joist in a section particularly adapted to residence floors - It is a sturdy, rugged structural unit. It will function as the purchaser has a right to expect. It is practically fool proof and one of a line of products which have proven their worth for over fifteen years.

MACOMBER RESIDENCE JOISTS

FABRICATING DETAILS

The joist is made in the form of a Warren Truss. The bottom chord and web members are of steel bars at least three eighths of an inch in diameter - The top chord is a laminated wood member made of two layers of 1 3/16" by 2-3/4" selected strips. Where the strips are spliced in forming the top chord a 2-5/8" by 5" steel plate 20 gauge thick is inserted between the strips as reinforcement. The connections of steel to steel are all Arc Welded - The connections of steel to wood are positive and formed to prevent slippage. The completed assembly is dip painted with a good quality black paint.

The Macomber Residence Joist is in every respect a rugged structural unit. It is made to stand up under rough treatment in handling transportation and erection. It will function as the owner has a right to expect.

ACCESSORIES

In using Macomber Residence Joists some accessories are required. The items and their use is as follows -

ANCHORS

Each joist placed parallel and along side of a wall is to be anchored to the wall at each line of bridging. If the wall is of wood studs tie the joist in with a few strands of 18 gauge tie wire - The same material may be used with masonry walls or use the side anchor we manufacture of 1/4" rods for the purpose.

When joists are supported on wood stud partitions they are nailed to the sill plates - With masonry walls a sill plate should always be placed to secure a uniform level bearing for the joists and the joists are nailed to this plate.

BRIDGING

A double strand of 14 gauge wire bridging placed diagonally between the joists and twisted tight is the standard. We make a channel bridging as shown in the details which will be furnished as required.

In placing wire bridging always nail a temporary wood strip across the top of the joists along the bridging line and place side wall anchors. Bridging may then be tightened to suit.

CEILING EXTENSIONS

For finished ceilings a ceiling extension at each end of each joist is necessary to carry through to the wall - These extensions and the method of attachment are shown in details.

EAVE ANGLES

In pitch roof construction the joists are anchored to walls with straps as shown in details.

HEADERS

Around small openings it is standard practice to use wood joist headers supported by hangers as shown. We make an angle header which will be furnished as ordered.

HANGERS

Hangers as shown are furnished for supporting wood joist headers.

INSTALLATION OF JOISTS

It is advisable to prepare a layout drawing in advance showing the location of joist. Where partitions over the floor slab are parallel with the joists double joists should be placed under the partition. Partitions running at an angle to the joists are considered as part of the live load.

In basements the supporting members may be masonry walls - wood joist partitions or in open areas steel or wood beams which in turn are supported by steel or wood columns.

LOADINGS

Forty pounds per square foot live load is ample for a good solid residence floor design. Add to this the dead weight of the floor - The total is the total uniform loading. It is the total uniform load capacity of the joists which is shown in the loading tables..

To determine the dead weight of the floor - Each item of the floor weighs approximately as follows -

	Wt. per sq.ft.
Steel Joists	2
Sub Flooring	3
Finished Flooring	3
Ceiling Plaster or Board	7
Plumbing & Heating Pipes	3
Ordinary Total Dead Weight	18 lbs. per sq.ft.

A total loading of 50 to 60 pounds per square foot is ample for the total load on Residence floors. This is more than usually provided in the ordinary wood joist residence floor.

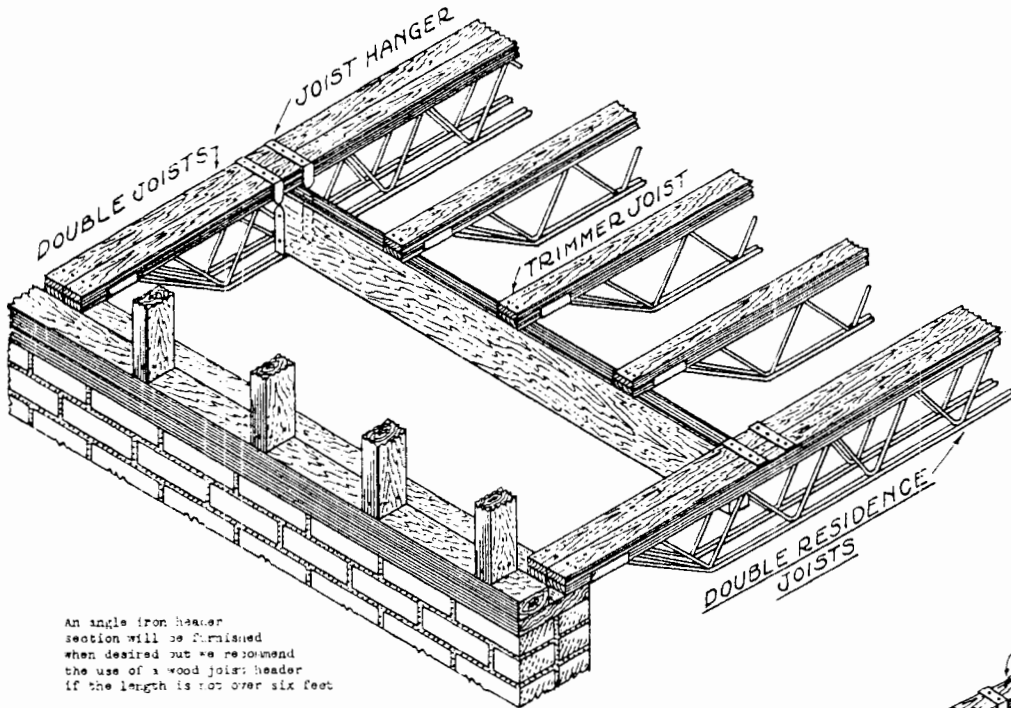
RECOMMENDATIONS

In constructing a Macomber Residence Joist floor space the joists as desired with the ends placed properly on the supports. If the joists rest on brick walls special attention should be given to securing a uniform level. A wood or metal sill should be placed in the wall for directly supporting the joists.

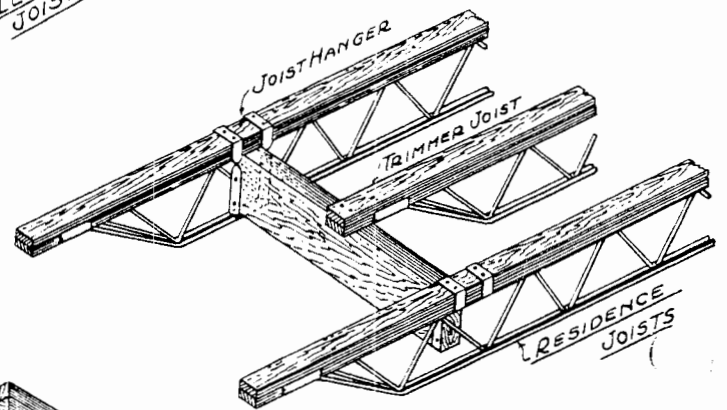
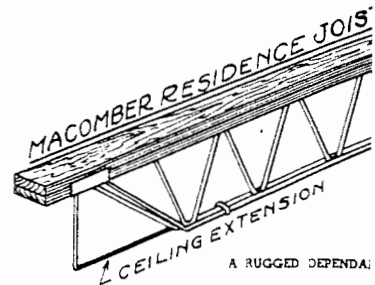
A temporary wood strip should be nailed along each line of bridging. This strip steadies the joist and facilitates the proper placing of the bridging. Either 14 gauge wire or channel bridging may be used as per details.

Flooring is laid exactly as with wood joists - We recommend a sub-flooring and a spacing of not over 20" c-c for floors and 24" c-c for roofs.

Ceilings may be constructed by attaching metal lath for a plastering base or the use of various sheet insulating materials - Methods of attaching are shown in details.



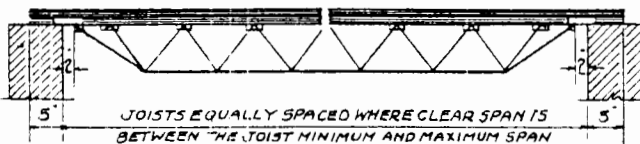
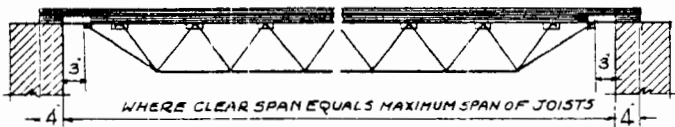
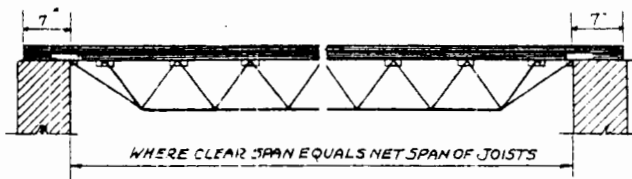
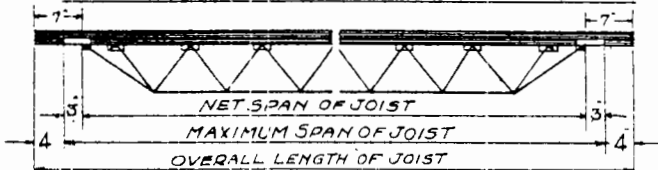
An angle iron header section will be furnished when desired but we recommend the use of a wood joist header if the length is not over six feet.



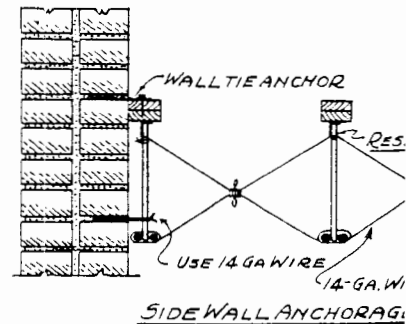
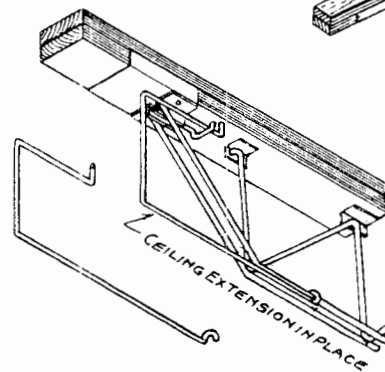
SPAN AND LENGTH INFORMATION

THE NOMENCLATURE OF THE JOISTS INDICATES THE MINIMUM CLEAR SPAN FOR THE JOISTS.

THE FOLLOWING SKETCHES SHOW HOW THE JOISTS ARE PLACED



THE JOISTS MAY BE SHOVED ENDWISE EITHER WAY THE CARRYING CAPACITY IS THE SAME. END DESIGN WILL FUNCTION WITH SUPPORTS OUT FURTHER THAN THE STANDARD 3' AS CONTEMPLATED FOR THE MAXIMUM SPAN.

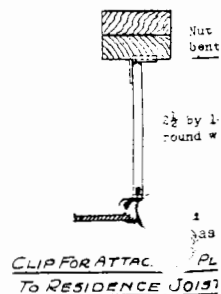


CEILING EXTENSION

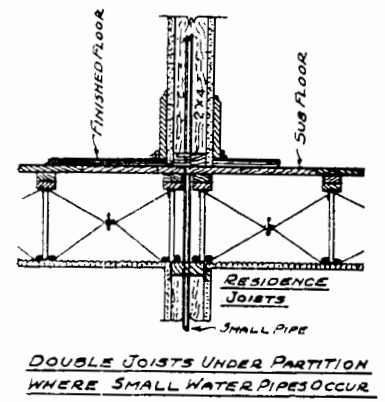
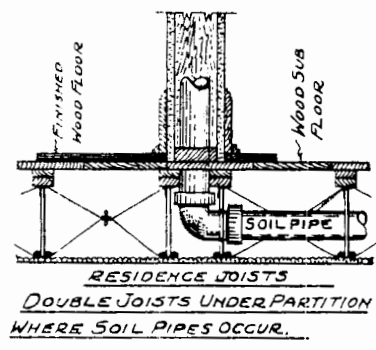
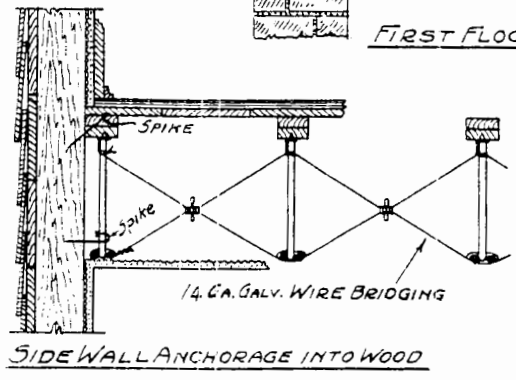
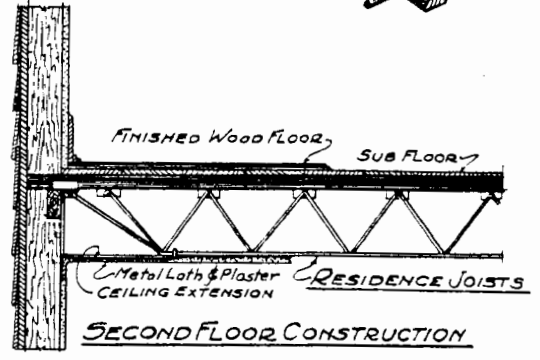
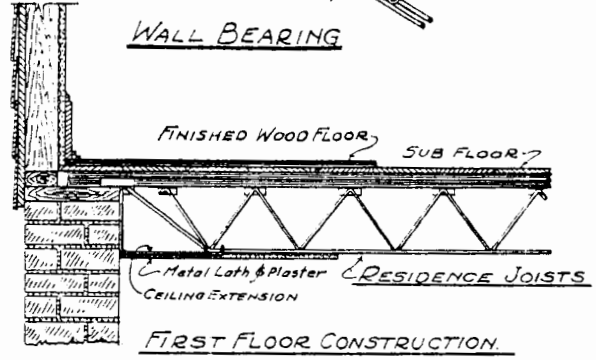
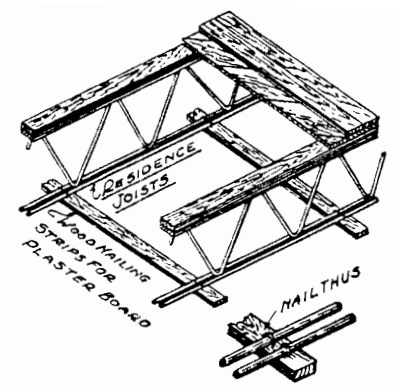
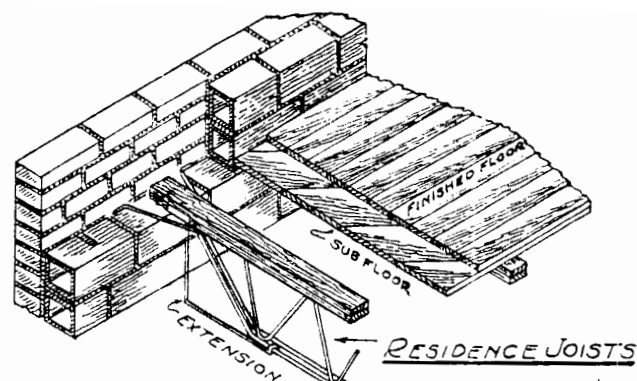
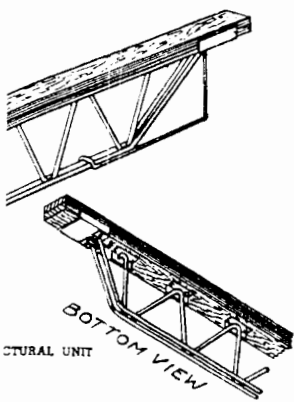
SAFE UNIFORM LOAD COMPARISON PER LINEAR FOOT BETWEEN RESIDENCE JOISTS AND ORDINARY WOOD JOISTS

STRESS 1200 POUNDS PER SQUARE INCH
USED FOR BOTH JOISTS AND DEFLECTION WITH IN ALLOWABLE LIMITS

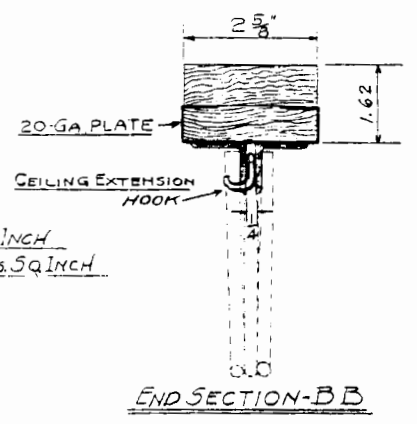
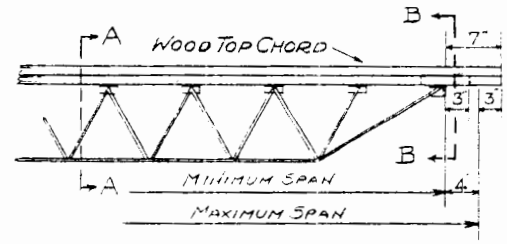
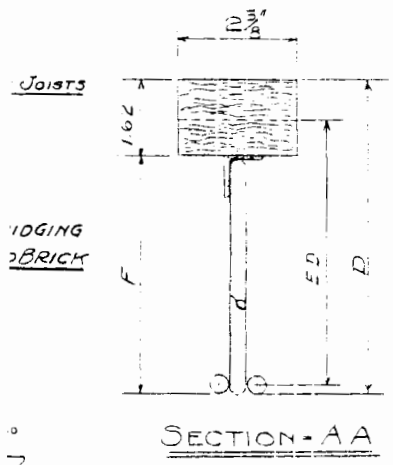
SPAN	RESIDENCE JOISTS			WOOD JOISTS			
	5R	8R	OR	2x6	2x8	2x10	2x12
10'	194	200	200	58	137	278	
12'	135	166	66	33	79	161	
14'	93	128	143		50	103	180
16'		99	121		33	68	121
18'		72	96			48	85
20'			78			35	62



BER JOISTS



MACOMBER RESIDENCE JOIST SHOWING MEMBER SIZES & AREAS



COMPRESSION STRESS IN WOOD TOP CHORD 1200 LBS. SQ. INCH
TENSION STRESS IN STEEL BOTTOM CHORD 18000 LBS. SQ. INCH

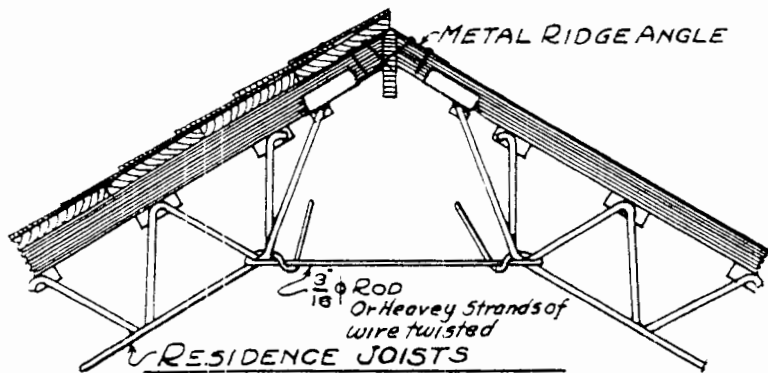
STEELS BOLT
1/16 by 2 1/2

SIZE OF JOIST	OVERALL DEPTH	F	WOOD TOP CHORD			STEEL BOTTOM CHORD			EFFECTIVE DEPTH	WEB BAR SIZE						RESISTING MOMENT	MAX END REACTION	JOIST SIZE
			AREA	STRESS CAPACITY	STRESS APPLIED	DIAM. BARS	AREA CHORD	STRESS CAPACITY		END WEB	INT. WEB	CENT. WEB						
6R	7.75	6 1/2	4.26	5112	4320	.390	.240	4320	6.75	.39	.12	.39	.12	.39	.12	29150	1000	6R
8R	9.75	8 1/2	4.26	5112	4320	.390	.240	4320	8.75	.39	.12	.39	.12	.39	.12	37800	1000	8R
10R	11.75	10 1/2	4.26	5112	4320	.390	.240	4320	10.75	.45	.16	.39	.12	.39	.12	46400	1000	10R

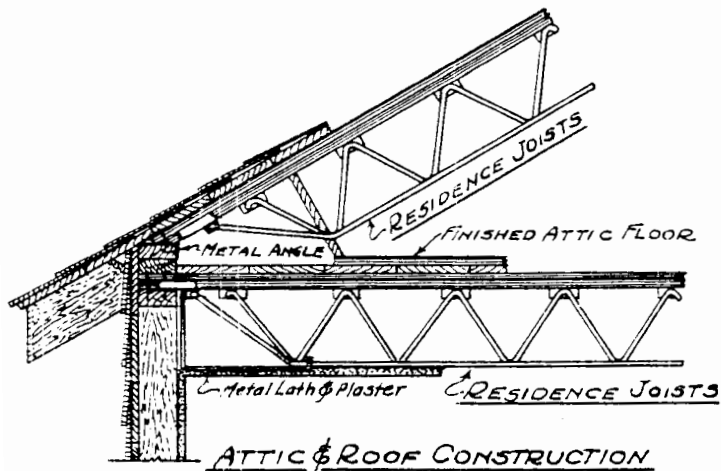
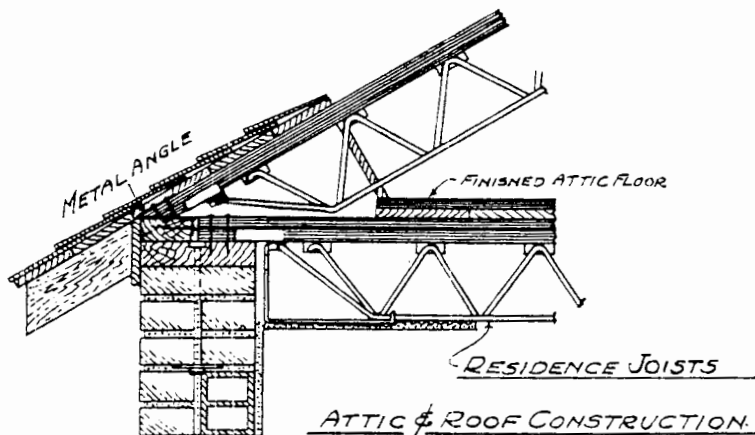
MACOMBER RESIDENCE JOISTS

ROOF CONSTRUCTION

THE FOLLOWING DETAILS SHOW THE APPLICATION OF MACOMBER RESIDENCE JOISTS IN ROOF CONSTRUCTION



ROOF CONSTRUCTION

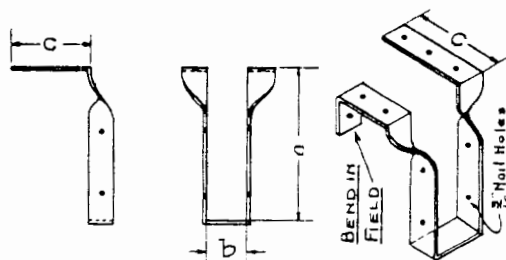


HANGERS

In ordinary hangers designate the size by the Hanger Number

CHANNEL BRIDGING

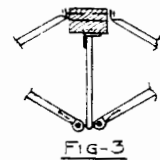
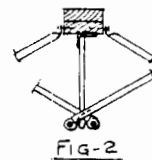
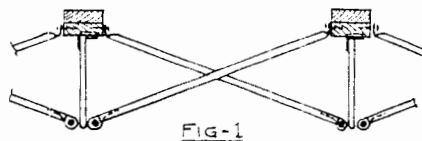
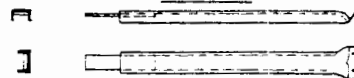
The sketch shows the application of this bridging. At the bottom of the joists the strap is wrapped around the bottom bar - At the top of the joist the bridging is nailed to the top chord. The different locations of the bridging allow a flexibility of joist spacing - Bridging is priced by the set - One set including the two pieces required for the complete bridging in one space between joists - In ordering use the bridging number or give the depth and spacing of joists.



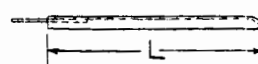
JOIST HANGERS
MADE FROM $1\frac{1}{2}$ " WIDE $\frac{1}{8}$ " THICK

TO SUPPORT WOOD JOISTS	HANGER DIMENSIONS			HANGER NUMBER
	DIMENSIONS			
	a	b	c	
2x4	5 $\frac{1}{8}$ "	1 $\frac{7}{8}$ "	6"	4
DOUBLE 2x4	5 $\frac{1}{8}$ "	3 $\frac{3}{4}$ "	6"	24
2x6	7 $\frac{1}{8}$ "	1 $\frac{7}{8}$ "	6"	6
DOUBLE 2x6	7 $\frac{1}{8}$ "	3 $\frac{3}{4}$ "	6"	26
2x8	9 $\frac{1}{8}$ "	1 $\frac{7}{8}$ "	6"	8
DOUBLE 2x8	9 $\frac{1}{8}$ "	3 $\frac{3}{4}$ "	6"	28
2x10	10 $\frac{1}{8}$ "	1 $\frac{7}{8}$ "	6"	10
DOUBLE 2x10	10 $\frac{1}{8}$ "	3 $\frac{3}{4}$ "	6"	210

CHANNEL BRIDGING FOR RESIDENCE
JOIST



RESIDENCE JOISTS CHANNEL BRIDGING



BRIDGING NUMBER	L	JOIST DEPTH		
		6 R	8 R	10 R
APPROX. JOIST SPACING C-C				
15	15"	15"	14"	12"
16	16"	16"	15"	14"
17	17"	17"	16"	15"
18	18"	18"	17"	16"
19	19"	19"	18"	17"
20	20"	20"	19"	18"
21	21"	21"	20"	19"
22	22"	22"	21"	20"

MACOMBER RESIDENCE JOISTS

TOTAL SAFE LOADING IN POUNDS PER SQUARE FOOT
UNIFORMLY DISTRIBUTED

JOIST	SPAN		TOTAL CAPACITY		LOADING CAPACITY PER SQUARE FOOT JOIST SPACING							
	From	To	Load Span	Total Load	12"	14"	16"	18"	20"	22"	24"	30"
6R-6	6'-0"	6'-6"	6'-0"	2000	333	283	250	222	200	181	166	133
6R-6½	6'-6"	7'-0"	6'-6"	2000	307	263	230	204	184	167	153	123
6R-7	7'-0"	7'-6"	7'-0"	2000	287	246	215	191	172	156	143	115
6R-7½	7'-6"	8'-0"	7'-6"	2000	266	223	199	177	159	145	133	106
6R-8	8'-0"	8'-6"	8'-0"	2000	250	213	188	167	150	136	125	100
6R-8½	8'-6"	9'-0"	8'-6"	2000	235	202	176	157	141	128	117	94
6R-9	9'-0"	9'-6"	9'-0"	2000	222	190	166	148	133	121	111	89
6R-9½	9'-6"	10'-0"	9'-6"	2000	210	180	157	140	126	114	105	84
6R-10	10'-0"	10'-6"	10'-0"	1940	194	166	145	129	116	105	97	77
6R-10½	10'-6"	11'-0"	10'-6"	1850	176	151	132	117	105	96	88	70
6R-11	11'-0"	11'-6"	11'-0"	1760	160	137	120	104	96	87	80	64
6R-11½	11'-6"	12'-0"	11'-6"	1690	146	125	110	97	88	80	73	58
6R-12	12'-0"	12'-6"	12'-0"	1620	135	115	101	90	81	73	67	54
6R-12½	12'-6"	13'-0"	12'-6"	1540	123	105	92	82	74	67	61	49
6R-13	13'-0"	13'-6"	13'-0"	1450	111	95	83	74	66	60	55	44
6R-13½	13'-6"	14'-0"	13'-6"	1375	102	87	77	68	61	55	51	40
6R-13½	13'-6"	14'-0"	14'-0"	1300	93	80	70	62	56	50	46	37
8R-8	8'-0"	8'-6"	8'-0"	2000	250	216	188	167	150	136	125	100
8R-8½	8'-6"	9'-0"	8'-6"	2000	235	202	176	157	141	128	117	94
8R-9	9'-0"	9'-6"	9'-0"	2000	222	190	166	148	133	121	111	89
8R-9½	9'-6"	10'-0"	9'-6"	2000	210	180	157	140	126	114	105	84
8R-10	10'-0"	10'-6"	10'-0"	2000	200	171	150	133	120	109	100	80
8R-10½	10'-6"	11'-0"	10'-6"	2000	190	163	142	127	114	103	95	76
8R-11	11'-0"	11'-6"	11'-0"	2000	182	156	136	121	109	99	91	73
8R-11½	11'-6"	12'-0"	11'-6"	2000	174	149	130	116	104	95	87	70
8R-12	12'-0"	12'-6"	12'-0"	2000	166	143	125	111	100	91	83	66
8R-12½	12'-6"	13'-0"	12'-6"	2000	160	137	120	106	96	87	80	64
8R-13	13'-0"	13'-6"	13'-0"	1940	149	128	112	100	90	81	74	60
8R-13½	13'-6"	14'-0"	13'-6"	1865	138	118	104	93	83	76	70	56
8R-14	14'-0"	14'-6"	14'-0"	1800	128	110	96	86	77	70	64	51
8R-14½	14'-6"	15'-0"	14'-6"	1735	120	103	90	80	72	65	60	48
8R-15	15'-0"	15'-6"	15'-0"	1675	112	96	84	75	67	61	56	44
8R-15½	15'-6"	16'-0"	15'-6"	1625	105	90	79	70	63	57	52	42
8R-16	16'-0"	16'-6"	16'-0"	1575	99	85	74	66	60	54	50	40
8R-16½	16'-6"	17'-0"	16'-6"	1500	91	78	68	61	55	50	45	36
8R-17	17'-0"	17'-6"	17'-0"	1435	85	73	64	57	51	46	43	34
8R-17½	17'-6"	18'-0"	17'-6"	1380	79	68	59	53	47	43	40	31
8R-17½	17'-6"	18'-0"	18'-0"	1320	74	63	56	49	45	40	37	30
10R-10	10'-0"	10'-6"	10'-0"	2000	200	171	150	133	120	109	100	80
10R-10½	10'-6"	11'-0"	10'-6"	2000	190	163	142	127	114	103	95	76
10R-11	11'-0"	11'-6"	11'-0"	2000	182	156	136	121	109	99	91	73
10R-11½	11'-6"	12'-0"	11'-6"	2000	174	149	130	116	104	95	87	70
10R-12	12'-0"	12'-6"	12'-0"	2000	166	143	125	111	100	91	83	66
10R-12½	12'-6"	13'-0"	12'-6"	2000	160	137	120	106	96	87	80	64
10R-13	13'-0"	13'-6"	13'-0"	2000	154	132	115	103	92	84	77	61
10R-13½	13'-6"	14'-0"	13'-6"	2000	148	127	111	99	89	81	74	59
10R-14	14'-0"	14'-6"	14'-0"	2000	143	122	107	95	86	78	72	57
10R-14½	14'-6"	15'-0"	14'-6"	2000	138	118	104	92	83	75	69	55
10R-15	15'-0"	15'-6"	15'-0"	2000	133	114	100	89	80	73	66	53
10R-15½	15'-6"	16'-0"	15'-6"	2000	129	110	97	86	77	70	64	52
10R-16	16'-0"	16'-6"	16'-0"	1935	121	103	91	81	73	66	61	48
10R-16½	16'-6"	17'-0"	16'-6"	1875	114	98	86	76	69	62	57	45
10R-17	17'-0"	17'-6"	17'-0"	1825	107	92	81	72	65	58	53	43
10R-17½	17'-6"	18'-0"	17'-6"	1770	101	87	76	67	61	55	50	40
10R-18	18'-0"	18'-6"	18'-0"	1720	96	82	72	64	57	52	48	38
10R-18½	18'-6"	19'-0"	18'-6"	1675	91	78	68	61	55	49	45	36
10R-19	19'-0"	19'-6"	19'-0"	1630	86	74	65	57	52	47	43	34
10R-19½	19'-6"	20'-0"	19'-6"	1590	81	70	61	54	48	44	40	32
10R-19½	19'-6"	20'-0"	20'-0"	1550	78	67	58	52	46	42	39	31

All loadings are computed for the clear span - The clear span is the net or clear distance between the inside edges of the supporting members. When used on the maximum span the joist has 4" of bearing at each end. The joist will function on another 2" of span leaving 3" of bearing at each end - The above safe uniform total loadings are based on the assumption the joists are braced laterally - particularly as to the top chords as in the finished floor construction. The nomenclature of the joist designates the depth - type and net span. The R indicates Residence Joist which is one of our types - The 10R-16½ joist is 10" deep with net span of 16'-6".

MACOMBER RESIDENCE JOISTS

INVESTMENT IN GOOD FLOOR JOISTS PAYS DIVIDENDS IN BENEFITS THROUGHOUT THE STRUCTURE. IT IS AN UNSEEN ITEM BUT IDENTIFIES THE CHARACTER OF A BUILDING. THE USE OF MACOMBER RESIDENCE JOISTS IN THE FLOOR CONSTRUCTION LIFTS A HOME OUT OF THE CLASS OF ORDINARY DWELLINGS. THERE IS THE COMFORT OF DEPENDABLE PROTECTION - THERE IS THE BASIS FOR A HOME - A HOME IN WHICH THE ACCUMMULATION OF FAMILY ASSOCIATIONS IS FOUNDED ON STURDINESS AND PERMANENCE.

MACOMBER
INCORPORATED
CANTON • OHIO