LOADING RULES

REVISED 1917

RULES GOVERNING

THE

LOADING OF LUMBER, LOGS, STONE, ETC.,

AND

Loading and Carrying Structural Materials, Plates, Rails, Girders, Etc.

ADOPTED BY THE
MASTER CAR BUILDERS' ASSOCIATION
AS RECOMMENDED PRACTICE,
1896.
ADVANCED TO STANDARD 1908.
REVISED 1917.

PUBLISHED BY THE ASSOCIATION,
1112 KARPEN BUILDING, CHICAGO, ILL.
1917.

Master Car Builders' Association

OFFICE OF THE SECRETARY,
1112 Karpen Building.

Changes in Loading Rules from 1916 Code to 1917 Code.

RULE 3.— Changed to conform to Interchange Rule 86, relative to the carrying capacity of cars.

RULE 7.— Revised to permit super-imposed loads on sides of gondola cars having sides 46 inches and less in height.

RULE 8.— Revised to conform to changes made in Rule No. 3.

RULES 9 and 10.— Reference to overhang of 6 inches; 6 feet 6 inches above rail omitted.

FIG. 1.— Revised to conform to change made in Rules 9 and 10.

RULE 12.— Rewritten.

RULE 13.— Revised to conform to changes in Rule 12.

RULE 15.— Second paragraph; revised to conform to changes made in Rule 3.

RULE 17.— Note added to rule permitting the use of blocks under bearing-pieces to obtain the required height.

Table of maximum weight of loads, page 22, revised to cover more modern equipment.

RULE 33.— Rewritten to clarify the intent of the rule.

RULE 34.— Section "B" revised to conform to Rule 33.

RULE 58.— Second paragraph, rewritten to clarify the paragraph.

FIGS. 18, 20 and 21.— Revised to conform to changes made in second paragraph of Rule 58.

RULE 59.— Omitted reference to Rules 35, 36 and 37.

RULE 67.— Note added to rule referring to loading of sawed and hewed ties, 12 ft. and over in length on flat cars.

RULE 81-C.— The size of clamps increased from 2 x 4 in. to 4 x 6 in., and the size of bolts reduced from 7/8 in. diameter to 3/4 in. diameter.

RULE 81-D.— The size of bolts required to secure the posts to car sides, reduced from 7/8 in. diameter to 3/4 in. diameter.

References in the Rule to sliding-irons changed to sliding plates.

RULE 93.— Note added calling attention to the greasing of sliding-plates at interchange points.

Heading on page 91; revised to conform to the lading covered by the rules that follow.

RULE 98-A.— Third paragraph; revised to more clearly cover cars requiring the doors boarded over.

RULE 121-C.— Rewritten to more clearly define the manner of securing derrick cars, steam shovels and similar pivoted machinery, when shipped on their own wheels or loaded on cars.

FIG. 99.— Revised to show strips nailed to inside of stakes.

RULE 124.— Paragraph added requiring the stripping of end doors of vehicle cars.

FIG. 103-A.— Inserted, covering another method of placing barrels in house cars. Reference made to Cut 103-A in Rule 125.

RULES FOR LOADING MATERIALS.

GENERAL INSTRUCTIONS.

1. The rules here given cover only the more common forms of lading. Where it is found they do not apply, special instructions must be asked for.

2. Cars must be carefully examined, ALL DEFECTS REMEDIED, and must be properly cambered.

All bolts used in securing bearing-pieces, sliding-pieces, braces, etc., should be riveted over to prevent the nuts from working off, or be secured by means of an effective lock nut or nut lock.

3. Where maximum weights of lading are not specified, the following will be allowed:

On cars of less than 80,000 lbs. capacity the usual excess of 10 per cent above marked capacity.

On cars of 80,000 lbs. capacity and over the maximum carrying capacity of axles, as follows:

Marked Capacity of Car.	Total Weight of Car and Lading.	Load Weight.
80,000	132,000	132,000, less light weight of car.
100,000	161,000	161,000, less light weight of car.
140,000	210,000	210,000, less light weight of car.

NOTE.— Cars of odd capacity over 80,000 lbs. must be classed according to axles under cars:

M. C. B. Standard 5 x 9 in.— 80,000 lbs. capacity.
M. C. B. Standard 5½x10 in.— 100,000 lbs. capacity.
M. C. B. Standard 6 x11 in.— 140,000 lbs. capacity.

4. All single cars must be so loaded that one HAND BRAKE IS ACCESSIBLE AND OPERATIVE. There must be a clearance of at least six (6) inches between the brake wheel and lading, this clearance to extend the width of the car, as per Fig. 1.

5. Cars should be in such condition that the trucks can curve freely. The maximum side-bearing clearance for loaded cars must not be more than $\frac{5}{16}$ inch per side bearing for loads less than ten (10) feet high from top of rail, and must not exceed $\frac{8}{16}$ inch per side bearing for loads ten (10) feet high or over, from top of rail.

6. The height and width of lading must be governed by the clearance limits of the roads over which the lading is to pass.

7. Lading will not be accepted if placed on top of box or stock cars. If lading is placed on top of sides of gondola cars, with wooden sides not more than 46 in. high and not less than 3 in. thick, or on top of steel sides especially reinforced to carry such top loads, the bearing pieces must be supported and held in place as per Figs. 41, 42 and 43, Rule 81; also Fig. 54, Rule 92. Lading must not be placed on top of wooden cars having sides less than three (3) in. thick or steel cars having sides not of sufficient strength to carry the lading.

A single overhanging load with one bearing-piece located on top of car sides over bolster on all steel gondola cars with sides of sufficient strength, must have the bearing-piece supported and held in place as shown in Fig. 43.

8. Lading must be so placed on the car that there will not be more weight on one side of the car than on the other. On cars of less than 80,000 lbs. capacity, one truck will not be allowed to carry more lading than 55

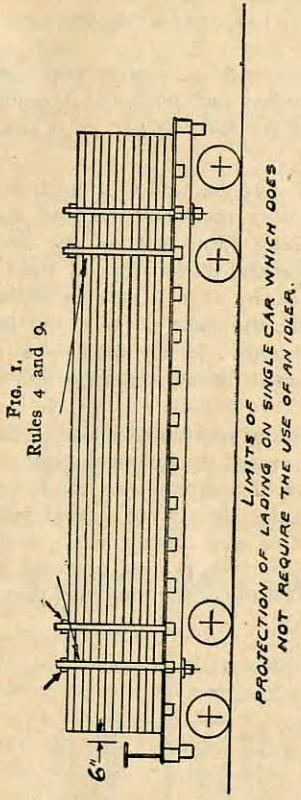


FIG. 1.
Rules 4 and 9.

per cent of the marked capacity of the car. On cars of 80,000 lbs. capacity or over, one truck will not be allowed to carry more lading than one-half of the load weight as defined in Rule 3. In case of doubt, this must be verified by weighing.

9. Lading on single cars must never project over end sill of car unless such overhang is protected by an idler or carrying car forming part of a group of cars. See Fig. 1.

10. An idler must be used to protect the overhanging load on another car when the load projects over end sill. The idler forms part of the shipment, and must not be detached, during transit, from the loaded car, except for cause, when it must be replaced by another car serving the same purpose and governed by the same restrictions. If the idler is a flat car of wooden construction, it must not be less than 80,000 lb. capacity.

11. The width of overhanging load placed on single cars must never exceed the following dimensions. When all the pieces are of approximately the same length the length of overhang should not exceed eighteen (18) feet, but shipments may contain pieces overhanging as much as twenty-four (24) feet provided the average length of the overhang of the total load does not exceed eighteen (18) feet.

Length of Overhang.	Width of Load.	Length of Overhang.	Width of Load.
C	W	C	W
9 ft. 0 in.	9 ft. 5 in.	18 ft. 0 in.	8 ft. 1 in.
10 ft. 6 in.	9 ft. 2½ in.	19 ft 6 in.	7 ft. 0 in.
12 ft. 0 in.	9 ft. 0 in.	21 ft. 0 in.	6 ft. 4 in.
13 ft. 6 in.	8 ft. 9½ in.	22 ft. 6 in.	5 ft. 8 in.
15 ft. 0 in.	8 ft. 7 in.	24 ft. 0 in.	5 ft. 0 in.
16 ft 6 in.	8 ft. 4 in.		

The overhang is measured from center of truck to extreme end of overhang, and load must be placed to maintain level on side bearings. See Figs. 33, 34 and 43.

For loads of greater height than 12 feet, subtract 2 inches from given width (w) of load for every inch of height in excess of 12 feet.

12 (a). All stakes, clamping pieces, bearing pieces and braces must be sound, straight-grained lumber (hardwood preferred) and free from knots that materially impair their strength, or may be rolled or built-up steel sections of equal strength.

(b) Hemlock or similar wood may be used only for the folowing loads:

For single loads of sawed lumber, Rules 32, 33 and 34, Figs. 5 and 6; for loading of tan bark, Rules 60, 61, 62, 63 and 64 (Figs. 22 and 23); for loading of slab wood, Rule 66; for loading of laths, Rule 66-A (Fig. 24), and for chocking and blocking for any loads.

(c) Care must be taken to keep the stakes from spreading at the top while the cars are being loaded, and in no case must the load exceed the width of the car.

(d) Unless otherwise specified, stakes for flat and gondola cars with sides less than thirty (30) in. high must be four (4) in. wide by five (5) in. deep, or saplings five (5) in. in diameter at center. For gondola cars with sides thirty (30) in. high or over, stakes must be four (4) in. wide by four (4) in. deep, or saplings four and one-half (4½) in. in diameter at center, tapered at the ends to accurately fit, extend through and completely fill the stake pockets.

(e) Gondola cars with sides 30 in. high and over

may have the stakes placed on inside of the car sides, either in or out of the pockets, providing the stakes rest on the car floor and are substantially wedged to the car sides by the lading.

(f) Where dimensions of stakes are given, the first figure, representing the width of stake, is measured parallel with side of car; and the second figure, representing the depth of stake, is measured at right angles to side of car.

(g) If stakes are of smaller dimensions than stake pockets they must be wedged to completely fill the pockets by driving wedges in from the top of the pocket and securely nailing them to the stakes.

NOTE.—The 30 inches for height of sides of gondola cars given in this rule is the dividing line for the size of stakes. This has no bearing on the 36-inch height of side of gondola cars, the latter being used with reference to loads placed on top of sides of gondola cars.

13. Opposite stakes must always be fastened together. When the specified fastening is by means of boards, there must be two boards for every pair of stakes, each board not less than one (1) by five (5) in., in section, and fastened at each end by not less than three ten-penny wire nails. (Hemlock may only be used for single loads, as provided for in Rule 12, section b). When the specified fastening is by means of wire, the wire used, unless otherwise specified, must be equal to six (6) strands of three (3) wrappings of good ⅛-in. diameter wire, and the wire must be secured to prevent it from slipping.

Three-sixteenth-inch diameter wire will be accepted as a substitute throughout the rules, provided the ends are securely twisted:

Two strands or one wrapping of $\frac{3}{16}$-in. wire will be

equivalent to 6 strands (3 wrappings) of ⅛-in. diameter wire.

Four strands or 2 wrappings of $\frac{3}{16}$-in. wire will be equivalent to 10 strands (5 wrappings) of ⅛-in. diameter wire.

14. Whenever cars are offered in INTERCHANGE and STAKES are not placed according to detail instructions, additional stake pockets may be applied by the receiving road and the cost of same charged to the delivering road.

15. The WEIGHT OF LADING carried on any car must be governed not only by the marked capacity of the car, but also by its general construction, as well as by the number and location of the bearing-pieces upon which the load rests. Wooden flat cars having but two truss rods must not be used for twin or triple loads.

To prevent overloading, the following regulations must be adhered to. Where reference is made to the capacity of the car, it implies:

For cars of less than 80,000 lbs. capacity, capacity plus 10 per cent.

For cars of 80,000 lbs. capacity and over, load-weight as defined in Rule No. 3.

(a) For loads carried on one bearing-piece per car (with or without sliding-pieces) located at or near center of car, the weight of lading must not exceed two-thirds the capacity of car when carried on flat or low-side gondola cars of all-steel or steel underframe construction, or on flat or low-side gondola cars of wooden construction having more than two truss rods. On steel flat and steel drop-end gondola cars con-

structed with fish-belly girders, the weight of lading must not exceed three-quarters of the capacity of car.

(b) For loads carried on one bearing-piece per car (with or without sliding-pieces), located about equal distance from center of car and center of truck, the weight of lading must not exceed three-quarters of the capacity when carried on cars of all-steel or steel underframe construction, or on flat or low-side gondola cars of wooden construction having more than two truss rods.

(c) For loads carried on one bearing-piece per car (with or without sliding-pieces), located at or near center of truck, or on top of sides of gondola cars located at any point between the bolsters, the weight of lading must not exceed one-half the capacity of the car. (See also Sec. E of Rule No. 15 and Rule No. 23.)

For loads on top of sides of gondola cars, the distance from top of rail to center of load, measured at bearing-pieces, must not exceed 9 feet 3 inches.

(d) Short material may be carried on floor of gondola cars under loads carried on top of sides, but should be distributed so that the load carried over each truck as well as across floor of car is equally balanced. The total load for wooden cars with wooden underframes must not exceed three-fourths (¾) the capacity of the car, and for cars with steel underframes the total load must not exceed the capacity of car.

(e) For twin or triple loads of long flexible material, such as plates or similar lading, requiring two or more sliding-pieces in addition to the bearing-pieces, the weight of lading must not exceed one-half the capacity of the car, and must conform to Figs. 52, 58, 59, 60 and 61. For materials of less flexibility,

such as heavy channels and "I" beams, see Rules 15-A, 15-B and 15-C, and Figs. 50 and 51.

(f) Omitted in 1915.

(g) Cars having drop ends shall not be loaded on top of sides unless corner stakes have been suitably reinforced.

The only exceptions are for cars which have been specially prepared for the shipment of particular forms of material.

Loads Too Long for Single Cars.

16. The CONSIGNEE AND DESTINATION of all the material in a group of cars must be the same.

17. The lading must always be kept CLEAR OF THE FLOOR AND END GATES OF THE CARS, both carrying cars and idlers. The amount of this clearance must not be less than four (4) inches and must conform to Rule 51.

NOTE.—If the four (4) in. clearance can not be obtained by the use of a 10 by 12 in. bearing-piece, three blocks may be placed between the bearing-piece and floor of car, one at center and one under each end, and securely fastened so they will not be displaced in transit. These blocks should be as wide as the bearing-piece and of such length (placed crosswise with bearing-piece) that the base of the block will be as long as the depth of bearing-piece and block combined.

18. A group of cars must have at least one accessible and operative hand brake for three cars, and two hand brakes for more than three cars.

19. All CARRYING CARS must be considered of the same capacity as the one of lesser capacity.

20. Flat cars must always be used when the load rests partly on one car and partly on another car, except where special provision is made for other types of cars.

21. Where the LADING PROJECTS over end sill, necessitating the use of an IDLER, and there is sufficient material in one consignment, another car may be loaded in reverse order and one idler serve for both cars. The space between the projecting ends of loads may be utilized to load the idlers with short material, but, in all cases, there must be a space of at least two (2) feet between the ends of such ladings.

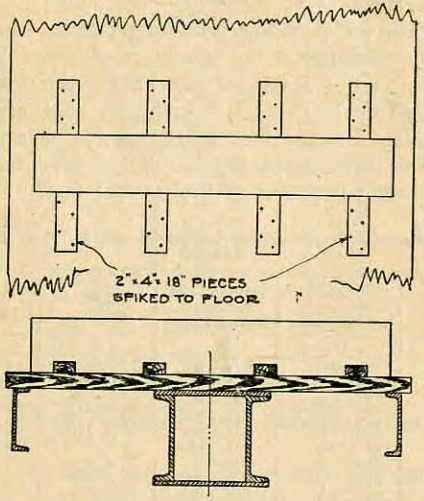
22. Where the dimensions of bearing-pieces or sliding-pieces are not otherwise specified, they must be of sufficient thickness to keep the lading four (4) inches from the floor or end gates of carrying car and idler, and must extend the full width of car. Bearing-pieces more than five (5) inches high may be built up of lumber of ample strength or take the shape of cribbing or rolled or built-up steel construction. Bearing-pieces, sliding-pieces, chocks, headblocks, etc., must have a width of base at least equal to their height. For structural material the bearing-pieces must be securely fastened to the floor of the car as per Rule No. 72. For lumber, logs, telegraph poles, piling and props, on open cars loaded as per Figs. 8, 10, 11, 12 and 13, the bearing-pieces must be securely held in place by cleats, as per Fig. 2.

FIG. 2.

RULE 22.

Manner of Blocking Bearing-Piece for Lumber, Logs, Telegraph Poles, Piling and Props.

See Figs. 8, 10, 11, 12 and 13.



23. BEARING-PIECES or sliding-pieces must never be placed between bolster and end of car, unless special provision is made therefor in detail instructions. When there is but one bearing-piece on a car, it must be placed at least twelve (12) inches from center of bolster toward center of car.

24. The preferable distance between bearing-pieces under lading on two or more cars is seven-tenths (7/10) of the total length of lading with allowable variation from six-tenths (6/10) to eight-tenths (8/10).

25. The width of long loads must never exceed the following dimensions for the given distance between bearing-pieces or length of overhang when load does not exceed twelve (12) feet in height, measured from top of rail. For loads of greater height, subtract two (2) inches from given width (W) of load for every inch of height in excess of twelve (12) feet.

DISTANCE BETWEEN BEARING-PIECES SIX-TENTHS (6/10) OF TOTAL LENGTH OF LADING.

Length of Load.	Distance between Bearing-Pieces.	Width of Load between Bearing-Pieces.	Length of Overhang.	Width of Overhang.
	D	W	C	W
50 ft.	30 ft. 0 in.	9 ft. 6 in.	10 ft. 0 in.	9 ft. 1 in.
55 ft.	33 ft. 0 in.	9 ft. 4 in.	11 ft. 0 in.	8 ft. 11 in.
60 ft.	36 ft. 0 in.	9 ft. 3 in.	12 ft. 0 in.	8 ft. 8 in.
65 ft.	39 ft. 0 in.	9 ft. 2 in.	13 ft. 0 in.	8 ft. 6 in.
70 ft.	42 ft. 0 in.	9 ft. 0 in.	14 ft. 0 in.	8 ft. 3 in.
75 ft.	45 ft. 0 in.	8 ft. 10 in.	15 ft. 0 in.	8 ft. 0 in.
80 ft.	48 ft. 0 in.	8 ft. 8 in.	16 ft. 0 in.	7 ft. 8 in.
85 ft.	51 ft. 0 in.	8 ft. 6 in.	17 ft. 0 in.	7 ft. 5 in.
90 ft.	54 ft. 0 in.	8 ft. 4 in.	18 ft. 0 in.	7 ft. 2 in.
95 ft.	57 ft. 0 in.	8 ft. 2 in.	19 ft. 0 in.	6 ft. 9 in.
100 ft.	60 ft. 0 in.	8 ft. 0 in.	20 ft. 0 in.	6 ft. 5 in.
105 ft.	63 ft. 0 in.	7 ft. 9 in.	21 ft. 0 in.	6 ft. 1 in.
110 ft.	66 ft. 0 in.	7 ft. 7 in.	22 ft. 0 in.	5 ft. 8 in.
115 ft.	69 ft. 0 in.	7 ft. 4 in.	23 ft. 0 in.	5 ft. 3 in.
120 ft.	72 ft. 0 in.	7 ft. 1 in.	24 ft. 0 in.	4 ft. 10 in.

NOTE.—For loads of uniform width throughout length of load the minimum width (W) for Distances Between Bearing-pieces (D) and Length of Overhang (C) applies.

DISTANCE BETWEEN BEARING-PIECES SEVEN-TENTHS (7/10) OF TOTAL LENGTH OF LADING.

Length of Load.	Distance between Bearing-pieces.	Width of Load between Bearing-pieces.	Length of Overhang.	Width of Overhang.
	D	W	C	W
50 ft.	35 ft. 0 in.	9 ft. 4 in.	7 ft. 6 in.	9 ft. 3 in.
55 ft.	38 ft. 6 in.	9 ft. 2 in.	8 ft. 3 in.	9 ft. 1 in.
60 ft.	42 ft. 0 in.	9 ft. 0 in.	9 ft. 0 in.	9 ft. 0 in.
65 ft.	45 ft. 6 in.	8 ft. 10 in.	9 ft. 9 in.	8 ft. 9 in.
70 ft.	49 ft. 0 in.	8 ft. 8 in.	10 ft. 6 in.	8 ft. 7 in.
75 ft.	52 ft. 6 in.	8 ft. 5 in.	11 ft. 3 in.	8 ft. 5 in.
80 ft.	56 ft. 0 in.	8 ft. 3 in.	12 ft. 0 in.	8 ft. 2 in.
85 ft.	59 ft. 6 in.	8 ft. 0 in.	12 ft. 9 in.	7 ft. 11 in.
90 ft.	63 ft. 0 in.	7 ft. 9 in.	13 ft. 6 in.	7 ft. 8 in.
95 ft.	66 ft. 6 in.	7 ft. 6 in.	14 ft. 3 in.	7 ft. 5 in.
100 ft.	70 ft. 0 in.	7 ft. 3 in.	15 ft. 0 in.	7 ft. 2 in.
105 ft.	73 ft. 6 in.	7 ft. 0 in.	15 ft. 9 in.	6 ft. 10 in.
110 ft.	77 ft. 0 in.	6 ft. 8 in.	16 ft. 6 in.	6 ft. 6 in.
115 ft.	80 ft. 6 in.	6 ft. 5 in.	17 ft. 3 in.	6 ft. 3 in.
120 ft.	84 ft. 0 in.	6 ft. 1 in.	18 ft. 0 in.	5 ft. 11 in.

DISTANCE BETWEEN BEARING-PIECES EIGHT-TENTHS (8/10) OF TOTAL LENGTH OF LADING.

50 ft.	40 ft. 0 in.	9 ft. 1 in.	5 ft. 0 in.	9 ft. 6 in.
55 ft.	44 ft. 0 in.	8 ft. 11 in.	5 ft. 6 in.	9 ft. 4 in.
60 ft.	48 ft. 0 in.	8 ft. 8 in.	6 ft. 0 in.	9 ft. 3 in.
65 ft.	52 ft. 0 in.	8 ft. 6 in.	6 ft. 6 in.	9 ft. 2 in.
70 ft.	56 ft. 0 in.	8 ft. 3 in.	7 ft. 0 in.	9 ft. 0 in.
75 ft.	60 ft. 0 in.	8 ft. 0 in.	7 ft. 6 in.	8 ft. 10 in.
80 ft.	64 ft. 0 in.	7 ft. 8 in.	8 ft. 0 in.	8 ft. 8 in.
85 ft.	68 ft. 0 in.	7 ft. 5 in.	8 ft. 6 in.	8 ft. 6 in.
90 ft.	72 ft. 0 in.	7 ft. 2 in.	9 ft. 0 in.	8 ft. 4 in.
95 ft.	76 ft. 0 in.	6 ft. 9 in.	9 ft. 6 in.	8 ft. 2 in.
100 ft.	80 ft. 0 in.	6 ft. 5 in.	10 ft. 0 in.	8 ft. 0 in.
105 ft.	84 ft. 0 in.	6 ft. 1 in.	10 ft. 6 in.	7 ft. 9 in.
110 ft.	88 ft. 0 in.	5 ft. 8 in.	11 ft. 0 in.	7 ft. 7 in.
115 ft.	92 ft. 0 in.	5 ft. 3 in.	11 ft. 6 in.	7 ft. 4 in.
120 ft.	96 ft. 0 in.	4 ft. 10 in.	12 ft. 0 in.	7 ft. 1 in.

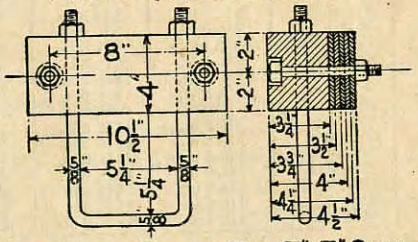
NOTE.—For loads of uniform width throughout length of load the minimum width (W) for Distances Between Bearing-pieces (D) and Length of Overhang (C) applies.

26. The cars must be jacked apart by placing one jack on each side of the coupler, separating the cars until the couplers are pulled out to the fullest extent, inserting hardwood or metal blocks to completely fill the space between horn of coupler and end sill, disconnecting the lock pin connection if secured to body of car, as shown in Figs. 3 and 4.

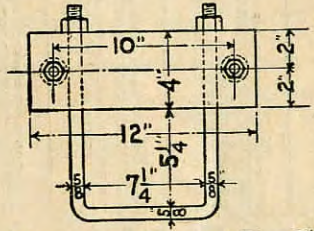
FIG. 3.

Rules 2, 26 and 28.

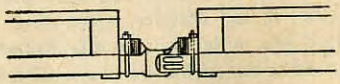
METAL SPACING BLOCKS FOR TWIN AND TRIPLE LOADS.



DETAIL OF BLOCK FOR 5"x5" SHANK.



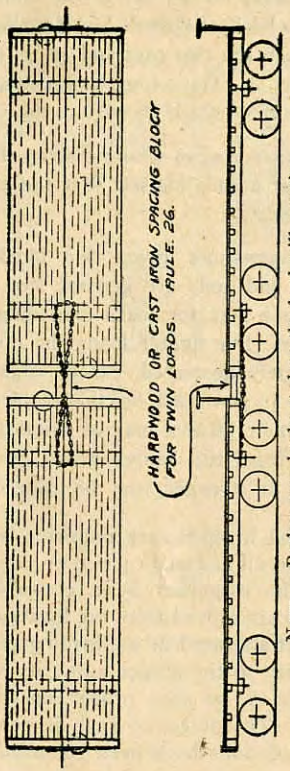
DETAIL OF BLOCK FOR 5"x7" SHANK.



ELEVATION SHOWING APPLICATION OF BLOCK.

FIG. 4.

Rules 26, 27 and 28.



NOTE.— Brakes may be located as the load will permit.

Chaining of cars when loaded with long material, size of chain to conform to M. C. B. Recommended Practice.

27. When cars are used which are not equipped with permanent safety chains, chains, if used, should be passed around body bolster and across under center sills, forming a loop back of bolster and doubling to point of coupling between the two cars and so tie them together as shown in Fig. 4. These long chains must have only a sufficient amount of slack to permit the cars to curve.

28. The INSPECTOR, in whose district the cars are to be loaded, must assure himself that the cars are properly blocked apart.

29. All DIMENSIONS given for blocking, bracing, bearing-pieces and rods are general, but represent the LEAST ALLOWABLE SIZE for loads exceeding one-half the capacity of car. For lighter loads the dimensions may be proportionately decreased, except where the size of timbers given is governed by the required clearance; however, any material that may be suitable for blocking, which differs from the figures given, but which is of equal strength or stronger, may be utilized.

30. Material in open cars requiring special staking or clamping and all material carried on two or three cars must always be examined by a competent INSPECTOR before the cars are moved from the loading point. If an inspector is not stationed at the loading point, the agent must give notice to the proper authority when the cars are to be loaded, so that proper inspection may be arranged for. The object of such inspection is to see that these regulations have been complied with.

31. If, in loading cars, it is impossible to clearly ascertain whether the restrictions given in General

Instructions under paragraphs 8 and 15 are complied with, the following table may be used:

MAXIMUM WEIGHT OF LOAD.

FOR LOADS AS PER FIGS. 8, 9, 33, 34 AND 43.

Length of Car.	Length of Material.	Capacity of Car 80,000 lb.	Capacity of Car 100,000 lb.	Capacity of Car 110,000 lb.
34 ft.	34 ft.	.....	93 000 lb.	.....
	36 ft.	.....	88 000 lb.	.....
	38 ft.	.....	83 000 lb.	.....
	40 ft.	.....	78 000 lb.	.....
	42 ft.	.....	73 000 lb.	.....
40 ft.	40 ft.	78 000 lb.	.....	107 000 lb.
	42 ft.	73 000 lb.	.....	101 000 lb.
	44 ft.	69 000 lb.	.....	96 000 lb.
	46 ft.	66 000 lb.	.....	91 000 lb.
	48 ft.	63 000 lb.	.....	86 000 lb.
42 ft.	42 ft.	.....	.....	108 000 lb.
	44 ft.	.....	.....	102 000 lb.
	46 ft.	.....	.....	97 000 lb.
	48 ft.	.....	.....	92 000 lb.
	50 ft.	.....	.....	88 000 lb.
44 ft.	44 ft.	.....	.....	108 000 lb.
	46 ft.	.....	.....	103 000 lb.
	48 ft.	.....	.....	98 000 lb.
	50 ft.	.....	.....	94 000 lb.
	52 ft.	.....	.....	89 000 lb.
46 ft.	46 ft.	.....	.....	109 000 lb.
	48 ft.	.....	.....	104 000 lb.
	50 ft.	.....	.....	99 000 lb.
	52 ft.	.....	.....	95 000 lb.
	54 ft.	.....	.....	91 000 lb.

FOR LOADS AS PER FIG. 12.

Length of Material	A	B	C	D	Marked Capacity of Cars. Pounds	Maximum Aggregate Weight of Load. Pounds.
	When loaded on cars 30 to 32 ft. long.					
40 ft. 45 ft.	10′ 3″ 11′ 9″	8′ 0″ 4′ 0″	5′ 9″ 6′ 3″	24′ 0″ 27′ 0″	50,000	105,000
	When loaded on cars 34 to 36 ft. long.					
40 ft. 45 ft.	10′ 3″ 11′ 9″	10′ 0″ 6′ 6″	5′ 9″ 6′ 3″	24′ 0″ 27′ 0″	60,000	120,000
	When loaded on cars 38 ft. long.					
50 ft. 55 ft.	10′ 0″ 12′ 0″	12′ 0″ 2′ 0″	5′ 0″ 8′ 0″	35′ 0″ 35′ 0″	80,000	160,000
	When loaded on cars 40 ft. long					
50 ft. 55 ft.	10′ 0″ 12′ 0″	18′ 0″ 8′ 0″	5′ 0″ 5′ 0″	35′ 0″ 38′ 0″	100,000	200,000

RULES GOVERNING THE LOADING OF LUMBER ON OPEN CARS.

DETAIL INSTRUCTIONS.

LUMBER LOADED ON SINGLE CARS, AS IN FIGS. 5 AND 6.

32. Where the length of lumber will permit, it must be similarly loaded in two piles on floor of car.

33. Lumber of equal thickness must either be lapped or have strips not less than ⅞ in. thick by 3 in. wide, the full width of load, spaced six feet apart longitudinally, to act as binders. Strips should be located not more than 30 in. apart vertically from floor of flat cars. Strips for gondola cars should also be spaced 30 in. apart vertically, the first strip to be at top of sides, providing that strips will not be required if load does not extend more than thirty (30) in. above the top of car sides. There must be not less than three strips for any one parting per pile.

34. For flat and gondola cars with sides less than 30 inches high the stakes should be 4 inches wide by 5 inches deep, and for gondola cars with sides 30 inches high and over the stakes should be 4 inches wide by 4 inches deep, straight-grained lumber, free from knots that would materially impair their strength, hardwood preferred. Tops of opposite stakes must be held together by two boards 1 inch thick by 4 inches wide, fastened at each end by not less than three ten-penny nails, or by four strands equal to two wrappings of good ⅛-inch diameter wire. See Figs. 5 and 6. For over-

hanging loads it must conform to Rule 13. The cross boards or wire should clear top of lading by at least two inches. If the number of stakes is greater than indicated in Sections A, B and C, but conforms to Section D of this rule, the wiring may be reduced to two strands equal to one wrapping of good ⅛-inch diameter wire.

SECTION A.— For loads in one or more piles on single cars the number of hardwood stakes must not be less than:

3 pair per pile for lengths not exceeding 20 feet.

4 pair per pile for lengths exceeding 20 feet.

SECTION B.— For loads of lumber lapped or stripped in accordance with Rule 33, the size of hardwood stakes must not be less than:

3 by 2 inches for load-height, not exceeding 3 feet 0 inches.

4 by 2 inches for load-height, between 3 feet 0 inches and 6 feet 0 inches.

3 by 4 inches for load-height, above 6 feet 0 inches.

SECTION C.— For loads of lumber not lapped or stripped, the sizes of hardwood stakes must not be less than:

2 by 4 inches for load-height, not exceeding 3 feet 0 inches.

3 by 4 inches for load-height, between 3 feet 0 inches and 6 feet 0 inches.

4 by 4 inches for load-height, above 6 feet 0 inches.

Heights of load given are measured either from floor line of flat cars or from top of sides of gondola cars.

SECTION D.— The following substitutes may be used for minimum sizes of hardwood stakes specified in preceding Sections B and C for single loads of lumber of one or more piles:

Substitutes for Each Pair of 4 by 2 Inch Hardwood Stakes.

One pair 3-inch saplings.	Hardwood.
One pair 4 by 3 inch stakes. One pair 6 by 2½ inch stakes. One pair 8 by 2 inch stakes. One pair 4-inch saplings. Two pair 4 by 2 inch stakes. Two pair 3-inch saplings.	Hemlock or similar wood.

Substitutes for Two Pair of 2 by 4 Inch Hardwood Stakes.

Two pair 3½-inch saplings. Four pair 3-inch saplings. Four pair 4 by 2 inch stakes.	Hardwood.
Two pair 4 by 4 inch stakes. Two pair 4½-inch saplings. Three pair 3 by 4 inch stakes. Four pair 2 by 4 inch stakes. Four pair 3½-inch saplings. Eight pair 3-inch saplings.	Hemlock or similar wood.

Substitutes for Three Pair of 2 by 4 Inch Hardwood Stakes.

Three pair 3½-inch saplings. Five pair 3-inch saplings. Six pair 4 by 2 inch stakes.	Hardwood.
Three pair 4 by 4 inch stakes. Three pair 4½-inch saplings. Four pair 3 by 4 inch stakes. Six pair 2 by 4 inch stakes. Six pair 3½-inch saplings. Ten pair 3-inch saplings.	Hemlock or similar wood.

Substitutes for Two Pair of 3 by 4 Inch Hardwood Stakes.

Two pair 4-inch saplings. Three pair 2 by 4 inch stakes. Three pair 4 by 3 inch stakes. Two pair 6 by 3 inch stakes. Two pair 12 by 2 inch stakes. Three pair 8 by 2 inch stakes. Four pair 6 by 2 inch stakes.	Hardwood.
Two pair 4 by 5 inch stakes. Two pair 5-inch saplings. Three pair 4 by 4 inch stakes. Four pair 4-inch saplings. Six pair 2 by 4 inch stakes. Six pair 4 by 3 inch stakes. Four pair 6 by 3 inch stakes. Four pair 12 by 2 inch stakes. Six pair 8 by 2 inch stakes. Eight pair 6 by 2 inch stakes.	Hemlock or similar wood.

Substitutes for Three Pair of 3 by 4 Inch Hardwood Stakes.

Three pair 4-inch saplings. Three pair 6 by 3 inch stakes. Five pair 2 by 4 inch stakes. Four pair 4 by 3 inch stakes. Three pair 12 by 2 inch stakes. Four pair 9 by 2 inch stakes. Six pair 6 by 2 inch stakes.	Hardwood.
Three pair 4 by 5 inch stakes. Three pair 5-inch saplings. Six pair 4-inch saplings. Five pair 4 by 4 inch stakes. Six pair 3 by 4 inch stakes. Four pair 8 by 3 inch stakes. Eight pair 4 by 3 inch stakes. Six pair 12 by 2 inch stakes. Eight pair 9 by 2 inch stakes. Twelve pair 6 by 2 inch stakes.	Hemlock or similar wood.

Substitutes for Two Pair of 4 by 4 Inch Hardwood Stakes.

Two pair 4½-inch saplings. Three pair 3 by 4 inch stakes. Four pair 2 by 4 inch stakes. Two pair 8 by 3 inch stakes. Four pair 4 by 3 inch stakes. Two pair 16 by 2 inch stakes. Four pair 8 by 2 inch stakes. Eight pair 4 by 2 inch stakes.	Hardwood.

Three pair 4 by 5 inch stakes. Three pair 5-inch saplings. Four pair 4 by 4 inch stakes. Four pair 4½-inch saplings. Six pair 3 by 4 inch stakes. Eight pair 2 by 4 inch stakes. Four pair 8 by 3 inch stakes. Eight pair 4 by 3 inch stakes. Four pair 16 by 2 inch stakes. Six pair 11 by 2 inch stakes. Eight pair 8 by 2 inch stakes. Sixteen pair 4 by 2 inch stakes.	Hemlock or similar wood.

Substitutes for Three Pair of 4 by 4 Hardwood Stakes.

Three pair 4½-inch saplings. Four pair 3 by 4 inch stakes. Six pair 2 by 4 inch stakes. Three pair 8 by 3 inch stakes. Six pair 4 by 3 inch stakes.	Hardwood.
Four pair 4 by 5 inch stakes. Four pair 5-inch saplings. Six pair 4 by 4 inch stakes. Eight pair 3 by 4 inch stakes. Twelve pair 2 by 4 inch stakes. Six pair 7½ by 3 inch stakes. Eleven pair 4 by 3 inch stakes.	Hemlock or similar wood.

Substitutes for Two Pair of 4 by 5 Hardwood Stakes.

Two pair of 5-inch saplings. Three pair 4 by 4 inch stakes. Four pair 3 by 4 inch stakes.	Hardwood.

Four pair 4 by 5 inch stakes. Four pair 5-inch saplings. Six pair 4 by 4 inch stakes. Eight pair 3 by 4 inch stakes.	Hemlock or similar wood.

Substitutes for Three Pair of 4 by 5 Hardwood Stakes.

Three pair 5-inch saplings. Five pair 4 by 4 inch stakes. Six pair 3 by 4 inch stakes.	Hardwood.
Six pair 4 by 5 inch stakes. Six pair 5-inch saplings. Nine pair 4 by 4 inch stakes. Twelve pair 3 by 4 inch stakes.	Hemlock or similar wood.

Substitutes for Each Pair of 3 by 2 Inch Hardwood Stakes.

One pair 2½ inch saplings.	Hardwood.
One pair 4 by 2 inch stakes. One pair 3-inch saplings.	Hemlock or similar wood.

LONG LUMBER LOADED ON TOP OF SINGLE LOADS AS IN FIG. 7.

35. Long pieces loaded as per Fig. 7 must rest on bearing-pieces not less than ten (10) inches wide and of sufficient thickness to provide four (4) inches clearance at all points, securely fastened across the top of lading of each car, and stakes must be wired at bearing-pieces.

36. The STAKES must extend up as shown, and be held together at top with either wire or boards. (In accordance with Rule 13.) The short lumber must be

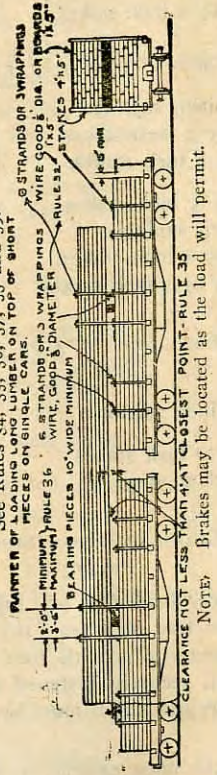


FIG. 7.

NOTE. Brakes may be located as the load will permit.

placed centrally on each car, and the bearing-pieces must be placed half-way between the stakes and as near the middle of the car as possible. Stakes must not be less than two (2) feet nor more than three (3) feet six (6) inches apart.

37. The MAXIMUM AGGREGATE WEIGHT must not exceed ninety (90) per cent of the capacity of the cars, and the amount of long lumber must not exceed one-half (½) the lading.

LUMBER LOADED AS PER FIGS. 8 AND 9.

38. This material may be carried on one car, either in the manner shown in Fig. 8, when all the material is of nearly equal length, or as shown in Fig. 9, when part of the material is long and part of the material short; the second car in both instances being simply an idler.

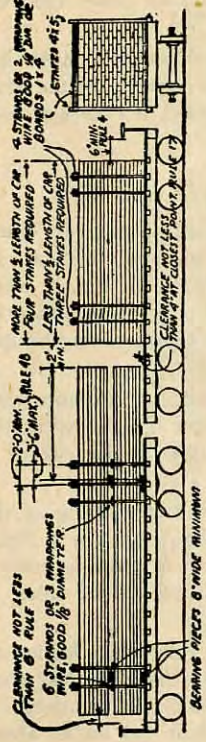
39. When the material is loaded in accordance with Fig. 8, the idler must invariably be a flat car, while the car carrying the load may be either a flat car or a drop-end gondola car.

40. When the material is loaded as per Fig. 9, the IDLER may be a gondola car, provided there is a clearance of at least four (4) inches between the bottom side of overhanging material and the top of sides or brake shaft of the idler.

41. The material on carrying car, when loaded as per Fig. 8, must rest on bearing-pieces not less than eight (8) inches wide, and of sufficient thickness to keep the ends of lumber at least four (4) inches above the floor of the idler, and in length equal to the full width of the car, to prevent the lading from touching the idler so that the cars can curve freely.

FIG. 8.

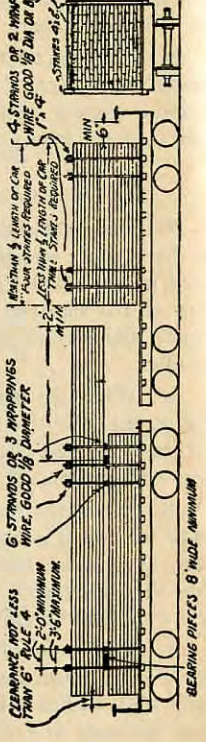
See Rules 12, 13, 17, 22, 31, 32, 33, 34, 35, 38, 39, 41, 43, 44, 45, 46, 48 and 59.



NOTE.— Brakes may be located as the load will permit.

FIG. 9.

See Rules 12, 13, 17, 31, 32, 33, 34, 35, 36, 38, 40, 42, 43, 44, 45, 46, 48, 53 and 59.



NOTE.— Brakes may be located as the load will permit.

For instructions in overhang, see Rule 11.

42. These BEARING-PIECES should be placed directly above the bolster, or as near to it as possible, but never between it and the end of the car. See also Rule No. 23. When the material is loaded as in Fig. 9, no extra bearing-pieces are required on the floor of the carrying car, as the short material loaded underneath the long material will take the place of the bearing-pieces.

43. The lading overhanging the idler, Figs. 8 and 9, must be governed by restrictions contained in General Rule No. 11, so that overhang will not exceed clearances in curving.

44. Short material may be loaded on the idler to the extent of two-thirds of its marked capacity.

45. The FIVE STAKES on each side of the carrying car should be placed as near the bolsters as possible, and no stakes whatever should be used on the idler to confine the overhanging part. The only stakes permitted on the idler will be such as may be required for the short lumber loaded on the idler. Where the pile of lumber on the idler exceeds 20 feet in length, four (4) stakes on each side must be used, three (3) on each side being sufficient for shorter piles to conform to Rule No. 34. All stakes should be fastened as shown in Figs. 8 and 9 and as provided for in Rules 12, 13, 34, 35 and 36.

46. As the load on one truck of the carrying car is in excess of that on the other, and in direct proportion to the load on bearing-pieces and the overhang, care should be taken in all cases to load as near as possible to the brake staff of carrying car, but a clearance of not less than six (6) inches must be allowed between lading and brake wheel of carrying car, as per Rule No. 4. See Figs. 8 and 9.

LUMBER LOADED AS PER FIGS. 10, 11, 12 AND 13.

47. This material (of any length) may be loaded on two or more cars.

48. STAKES and bearing-pieces must be placed as indicated in the diagrams. Stakes must be wired at the center and fastened at the top with either boards or wire, in accordance with Rules 12, 13, 35 and 36. Stakes must not be less than two (2) feet nor more than three (3) feet six (6) inches apart.

49. BEARING-PIECES must not be less than ten (10) by ten (10) inches in section, and, if possible, should be placed at equal distances from the centers of bolsters on both carrying cars.

50. When necessary to make the width of lading less than width of car, on account of long overhang or distance between bearing-pieces, FILLING-PIECES must be placed between the stakes and lading and securely fastened to inside of stakes. See Fig. 15.

LUMBER ON GONDOLA CARS AS PER FIGS. 14 AND 15.

51. Long material may be LOADED ON GONDOLA CARS that have drop-end gates, provided that when loaded on two cars, BEARING-PIECES of sufficient thickness are used to keep the load clear of the end gates and floor by at least four (4) inches, and in addition to the bearing-pieces on the floor there is a clearance at each side of load of at least eighteen (18) inches between the load and the car side and end-gate stops at narrowest point to provide for curving, as shown in Fig. 14. This clearance may be obtained by the use of stanchions, not less than four (4) by five (5) inches in section, placed in a vertical position, and securely fastened by cleats to the floor bearing-pieces in such a manner as to make the floor bearing-pieces serve as a brace between them,

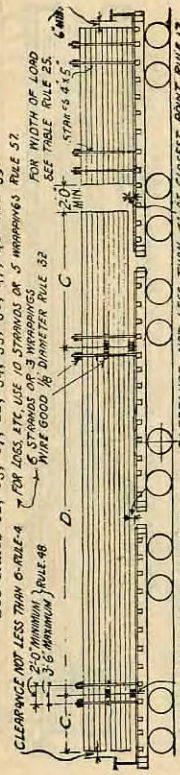


FIG. 10.

See Rules 12, 13, 17, 22, 34, 35, 36, 47, 48 and 59.

NOTE.— Brakes may be located as the load will permit.

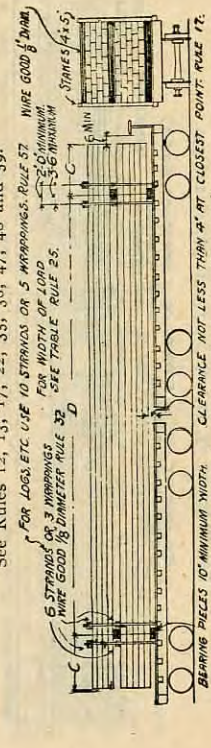


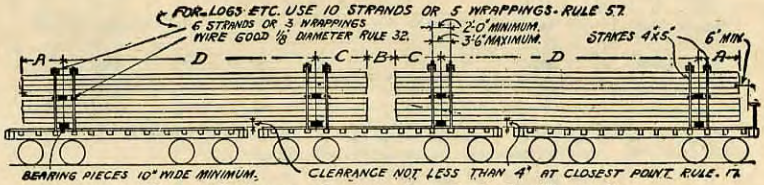
FIG. 11.

See Rules 12, 13, 17, 22, 35, 36, 47, 48 and 59.

NOTE.— Brakes may be located as the load will permit.

FIG. 12.

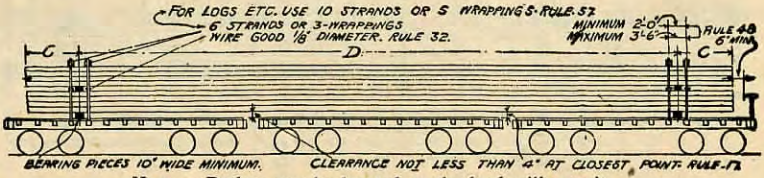
See Rules 12, 13, 17, 22, 31, 35, 36, 47, 48 and 59.



NOTE.— Brakes may be located as the load will permit.

FIG. 13.

See Rules 12, 13, 17, 22, 31, 35, 36, 47, 48 and 59.



NOTE.— Brakes may be located as the load will permit.

FIG. 14.

See Rules 12, 13, 33, 36, 48, 51, 91 and 95.

Clearance Not Less than 18 in. for Twin Loads and 39 in. for Triple Loads.

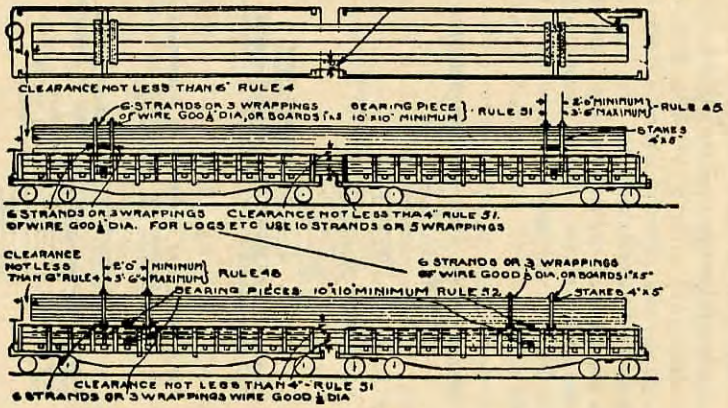


FIG. 15.

See Rules 12, 13, 35, 36, 48, 51, 52 and 59.

NOTE.— Brakes may be located as the load will permit.

and to be fastened together with wire at center and either boards or wire at top, as specified in Rules 12, 13, 35 and 36.

52. If the load projects above the sides of car, bearing-pieces not less than ten (10) by ten (10) inches, properly cleated on the inside of sides, must be placed on car sides, and securely braced to prevent both longitudinal and lateral motion. See Fig. 15. The material placed on these bearing-pieces may be loaded to the full width of car. Stakes must be placed as shown in Fig. 15, and must be wired above car sides and again at top.

FIG. 14-A.

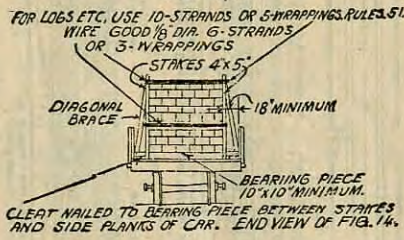
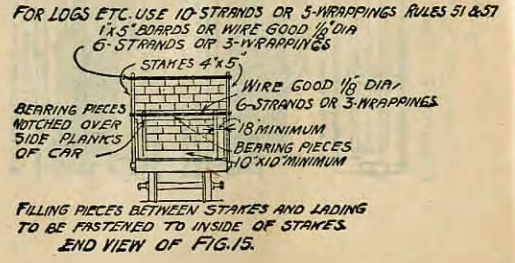


FIG. 15-A.



RULES GOVERNING THE LOADING OF DRESSED LUMBER.

53. If the lading consists of dressed lumber, and the shippers desire to do so in order to prevent sap stains, strips of rough lumber not more than two (2) inches nor less than one (1) inch thick, by not more than six (6) inches nor less than four (4) inches wide, may be placed crosswise between each layer of lumber. All strips over one and three-eighths (1⅜) inches thick must be six (6) inches wide. There must be one cross-piece to each pair of stakes on opposite sides of the car and between each layer of lumber. These strips must be of the same thickness for each layer of lumber, and must be neatly fitted between and butt against the stakes. When loaded as per Figs. 5, 7 and 9, the strips may be placed on the floor of the car as well as between the layers.

RULES GOVERNING THE LOADING OF LOGS, TELEGRAPH AND TELEPHONE POLES, PILING AND PROPS ON OPEN CARS.

54. Material of this description must be loaded with the BUTTS AND TOPS ALTERNATING.

If the lading rests on two or more cars, it must rest on BEARING-PIECES not less than ten (10) by ten (10) inches in section.

LOGS.

55. Logs twenty (20) inches or over in diameter must be loaded in pyramidal form with the largest logs at the bottom, as shown in Fig. 16, with the large ends

Fig. 16.

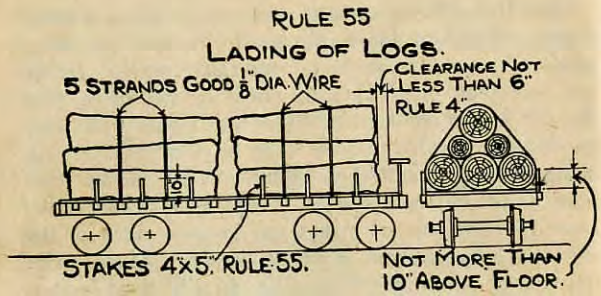
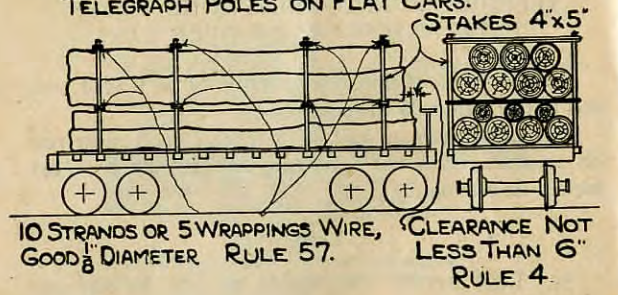


Fig. 17.



of the first course toward the end of car. There must not be less than three (3) pairs of stakes of hardwood or live saplings, square on end, to completely fill the stake pockets. Stakes must be four (4) inches by five (5) inches in section, accurately fitted to the stake pockets, and to extend not more than ten (10) inches above the car floor. For long logs there must be one pair of stakes for each length of five (5) feet or fraction thereof. The logs must be bound by means of five 5) strands of good ⅛-inch diameter wire, passing over top of lading and fastened to stake pockets. There must be at least two such ties for each tier. See Fig. 16.

Note.— Logs loaded in accordance with Fig. 16, secured by means of permanent short stakes and chain in lieu of the specified staking and wiring, will be acceptable.

Logs, Piling, Props, Telegraph and Telephone Poles.

56. When material of this kind is loaded on flat or gondola cars with sides less than 30 inches high, and lading does not exceed 4 feet in height measured from floor, and the lading is not loaded in pyramidal form, the stakes must be as high as the lading and must be tied together at the top with not less than eight strands equal to four wrappings of good ⅛-inch diameter wire and must be tight. Stakes must be sound hardwood, free from knots and of the dimensions specified in General Rule No. 12.

57. If the material is loaded on flat cars or gondola cars with sides less than 30 inches high, to a height more than 4 feet measured from floor, opposite stakes must be bound together with wire at about one-third of the height above car floor after one-third of the load has

been placed on the car, and in such a manner that when the remaining load is placed on the car the wire will have a tendency to draw the tops of the stakes toward each other. The middle as well as the top wrapping of wire must consist of not less than ten strands equal to five wrappings of good ⅛-inch diameter wire and must be tight. Bearing-pieces may be placed between the lower and upper sections of load to facilitate application of wire after all the lading has been placed on the car. See Fig. 17. Stakes must be sound hardwood free from knots and of the dimensions specified in General Rule No. 12. Stakes must incline toward center of car a total of about 12 inches before load is placed on car, and in no case will they be allowed to incline away from center of car after the car is loaded. The inspector must assure himself that all wiring is tight before load is moved.

58. When lading is placed inside of a single gondola car with sides 30 inches high or over and load projects above car sides, not less than three pair 4 by 4 hardwood stakes or three pair of 4½-inch live saplings should be well secured to either side of lading on inside of car for piling or props 20 feet or less in length. Four stakes of the same size should be used on each side of load over 20 feet and less than the length of the car. If the length of lading is greater than the length of car five stakes should be used on each side. Stakes must be wired at top with six strands, equal to three wrappings of good ⅛-inch diameter wire, If the lading extends more than 3 feet above top of car sides, the intermediate wire must be used and drawn sufficiently to pull the stakes inwardly when final load is placed thereon.

When lading is in two piles on flat or gondola cars, and ends of poles are interlaced at center of car as per

Figs. 18, 19, 20 and 21, there must be not less than three pairs of stakes per pile, or six pairs of stakes for total length of load.

59. Logs, piling and telegraph poles loaded as a single overhanging load or on two or more cars should

FIG. 18.

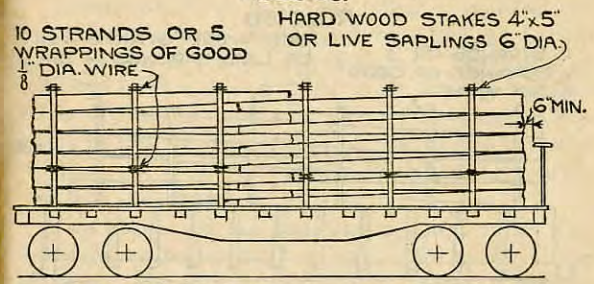
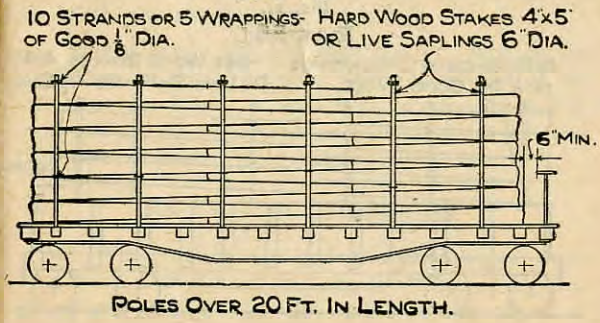


FIG. 19.



conform to Figs. 8, 9, 10, 11, 12, 13, 14 and 15, and Rules 38, 39, 48, 49, 50, 51, 52 and 58. If lading is less than four (4) feet high, Rule 56 should be followed, and when more than four (4) feet high, Rule 57 should be followed. The wiring of stakes should conform to Rule 57 for flat cars and Rule 58 for gondola cars.

FIG. 20.

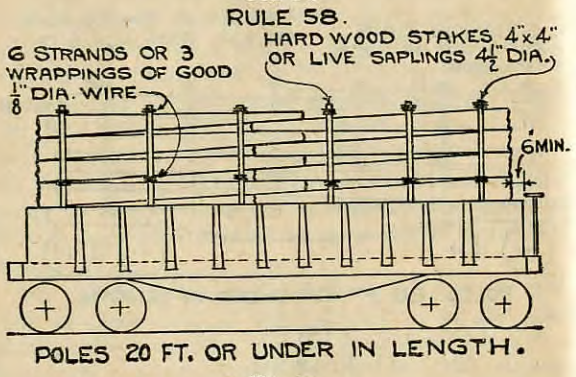
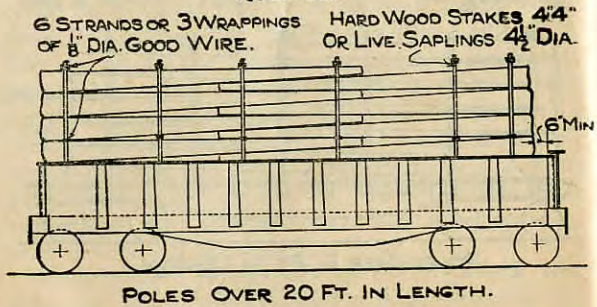


FIG. 21.



THE LOADING OF TAN BARK.

FOR LOADS ON FLAT CARS.

60. When tan bark is loaded on flat cars there must be four stakes properly fastened at each end of car.

There must be at least four stakes at each side of car, accurately fitted to stake pockets — Rule 34, Section B, to govern size and kind of stakes. Two pairs of side stakes, those nearest center of car, must be fastened across the top by means of wire. The wiring should not be of less than two strands of good ⅛-inch diameter wire per pair of stakes, twisted sufficiently to hold stakes in a vertical position.

Two boards not less than one (1) inch by six (6) inches in section, spaced four (4) inches apart, or one board one (1) inch by twelve (12) inches in section, must be securely nailed to inside of end and side stakes. See Fig. 22.

The load must extend to, but not beyond the top line of the top board at time of loading.

Diagonal braces not less than one (1) inch by six (6) inches in section must be nailed to outside of car frame, or car sides, to outside of top boards and to inside of second stake from end of car, with not less than three ten-penny wire nails.

FOR LOADS ON GONDOLA CARS.

61. Where tan bark is loaded in gondola cars there must be at least four stakes properly fastened at each end of car, and sufficient side stakes on side of car so that the spacing between stakes or between stakes and

end of car does not exceed twelve (12) feet. Rule 34, Section B, to govern size and kind of stakes. Two boards not less than one (1) inch by six (6) inches in section spaced four (4) inches apart, or one board one (1) inch by twelve (12) inches in section should be securely nailed to inside of the end and side stakes about twelve (12) inches below top of stakes. See Fig. 23.

62. Gondola cars with sides less than thirty (30) inches high should be governed by the same rules as for flat cars.

63. Gondola cars, with sides thirty (30) inches high, must have end stakes secured at bottom by nailing a plank two (2) inches by four (4) inches in section to floor inside of bottom of stakes. Cars equipped with stakes so secured may be loaded to nine (9) feet above floor. If the load exceeds nine (9) feet in height, the tops of opposite stakes must be connected by wire or boards. For such lading the wire must consist of at least one strand of good ⅛-inch diameter wire.

64. Gondola cars with sides more than thirty (30) inches high may be loaded to a height of nine (9) feet above floor without the use of plank nailed to the floor.

65. It will be the duty of the inspector to carefully examine the load to note that the bark is interlaced and sufficiently secured to make the lading safe for transit.

The Loading of Slab Wood.

66. Open cars loaded with slab wood will not be accepted (unless otherwise agreed) if the same instructions as given in Rules 60 and 65 for loading tan-bark

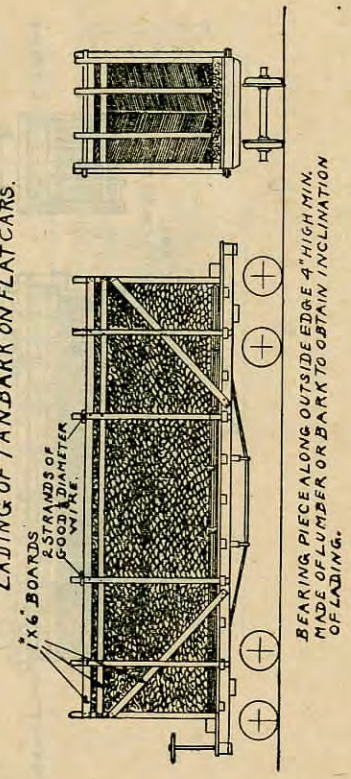


Fig. 22.
Rule 60.

FIG. 23.

Rules 61, 62, 63, 64 and 65.

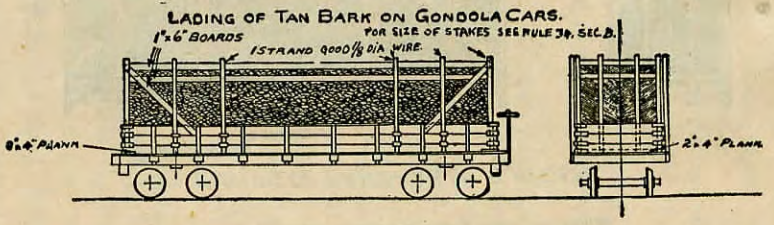
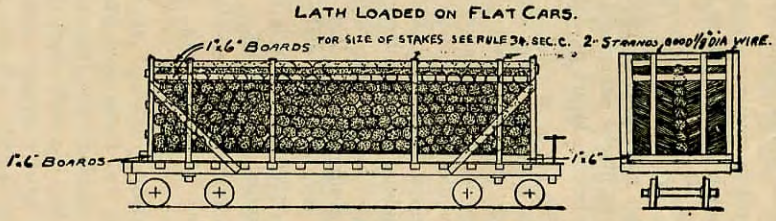


FIG. 24.

Rule 66-A.



have not been complied with, precaution being taken to see that the ends and side boards are high enough to prevent slabs from sliding off the car.

66A. General instructions given for tan-bark should govern the loading of lath, but, in addition, these rules should be followed:

Boards one (1) inch by six (6) inches in section, placed on edge, and fastened inside of side and end stakes, should be placed immediately above floor of car, to prevent the bottom layers of lath from shifting endwise or sidewise.

Immediately inside of lower course of side boards bundles of lath should be laid longitudinally, and a longitudinal row of bundles should be placed along center of car. Bundles should then be laid crosswise, butting against center longitudinal row, and resting on top of side longitudinal rows. Succeeding courses should be laid crosswise in the same manner, butting against additional longitudinal rows laid between them over center line of car. Opposite stakes must then be fastened together with either boards or wire, in the same manner as required for tan-bark.

RULES GOVERNING THE LOADING OF TIES, FENCE POSTS AND SIMILAR LADINGS ON OPEN CARS.

SHOWN IN FIG. 25.

67. Flat cars loaded with cross ties or fence posts and similar short material will not be accepted for shipment, unless otherwise agreed.

NOTE.— Sawed ties more than 12 ft. in length may be loaded on flat cars, subject to the rules governing the loading of lumber on open cars.

Hewed ties more than 12 ft. in length may be loaded on flat cars, subject to the rules governing the loading of logs, piling, props, telegraph and telephone poles.

68. Gondola cars will be accepted with loads not to exceed 4 feet above the end gate of car. If the load is built up in pyramidal form above sides of car, each tier must be loaded flatwise above end gate so as not to wedge or spread the sides. Lading must not extend over the sides of car and must be wired as provided for in Fig. 25.

69. If the load extends more than 12 inches above end or end gate at center, each pile must be tied across top by at least two binders. Each binder is to be fastened to each tie in passing over the load. See Rules 70 and 71 for manner of securing binders.

69A. As an alternate method of loading in gondola cars, ties, fence posts, cord wood and similar material may be loaded vertically, or inclined, provided the height of load is not more than one and one-half times the height of car sides, measured from floor to top of load (see Figs. 26 and 27). When the inside width of car is less or greater than the length of the material to be loaded, and such a method is preferred, the load can be built up as shown in Figs. 28 and 29.

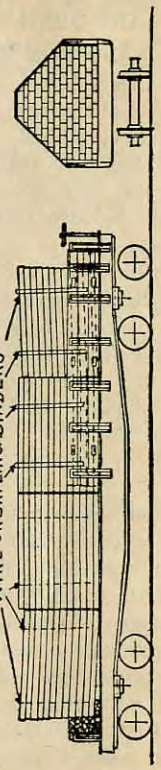


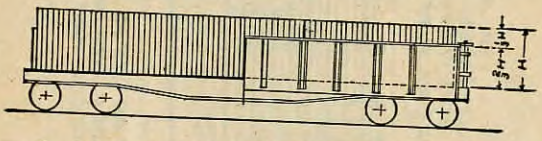
FIG. 28.
Rules 68, 69, 70 and 71.

70. When wire is used it must not be less than good ⅛-inch diameter, and but one strand may be used, the wire to be secured to the side of car with at least three (3) nails or staples, or to stake pockets, or through holes in top of flange on side of steel cars, or fastened to outside edge of first tie projecting above car side.

71. When SAPLING is used it must be of green timber, split, and not less than one and one-half (1½) inches wide on the split or flat side. The ends of the sapling must extend at least twelve (12) inches below car side and be securely fastened to each tie with nails in passing over the load.

FIG. 26.
Rule 69-A.

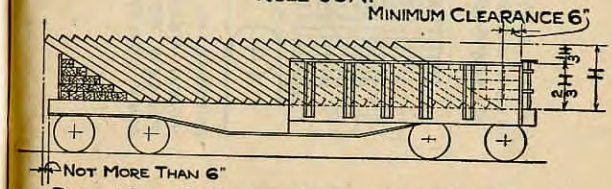
Loading of Short Pieces Not More than 9 ft. 0 in. long, Such as Ties, Fence Posts, Cordwood, etc., in Gondola Cars.



Pieces Loaded Vertically if the Length is Not More than One and One-half Times Inside Height of Car Sides.

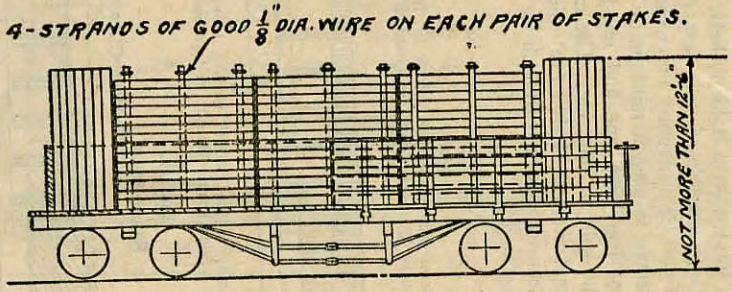
FIG. 27.

RULE 69A.



PILES MUST BE INCLINED IF THE LENGTH IS MORE THAN ONE AND ONE HALF TIMES THE INSIDE HEIGHT OF CAR SIDES.

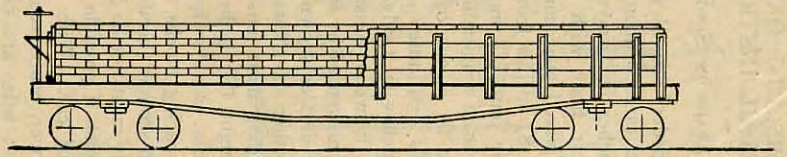
FIG. 28.
RULE 69-A



WHEN INSIDE WIDTH OF CAR IS LESS THAN LENGTH OF PIECES TO BE LOADED. END BLOCKING AND STAKES MAY CONSIST OF PIECES PLACED VERTICALLY.

FIG. 29.

LOADING OF TIES, FENCEPOSTS, ETC. IN GONDOLA CARS.
RULE 69-A.



WHEN INSIDE WIDTH OF CAR IS GREATER THAN LENGTH OF PIECES LADING MAY BE PLACED TRANSVERSELY.

RULES GOVERNING THE LOADING OF LONG STRUCTURAL MATERIAL, PLATES, RAILS, GIRDERS, ETC., ON OPEN CARS. DETAIL INSTRUCTIONS.

Loads on Single Cars.

72. Large girders loaded on flat side on flat cars must always be carried upon bearing-pieces not less than six (6) inches by twelve (12) inches in section, bolted to the car floor with 7/8-inch bolts. Bearing-pieces must be placed near each bolster and not more than eighteen (18) inches from center line of bolster. Two (2) inch by four (4) inch by eighteen (18) inch cleats must be placed longitudinally under the floor and must be secured by means of bolts with cut washers under bolt heads and nuts. Spacing blocks not less than two (2) inches by twelve (12) inches in section must be placed between consecutive girders. Lateral motion must be prevented by fitting planks between the flanges of the girders as shown in Fig. 32. Girders may be clamped together as shown in Fig. 31. When so loaded, the blocking used must not be less than three (3) inches by eight (8) inches in section for bearing blocks on car floor, two (2) inches by eight (8) inches in section for spacing blocks, and four (4) inches by six (6) inches in section (hardwood) for top tie planks. The vertical rods must not be less than one (1) inch in diameter, and must, if possible, pass through the blocking and floor of car. With loads twenty-four (24) inches high or over, braces must be added as shown in Fig. 63. If rivet holes are not available, longitudinal motion must be prevented by using clamps. See Fig. 31.

73. Large girders, loaded as shown in Fig. 33, must

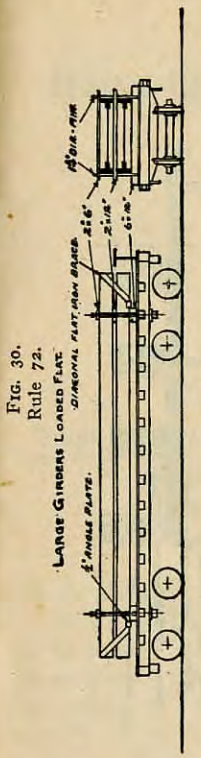


Fig. 30.
Rule 72.

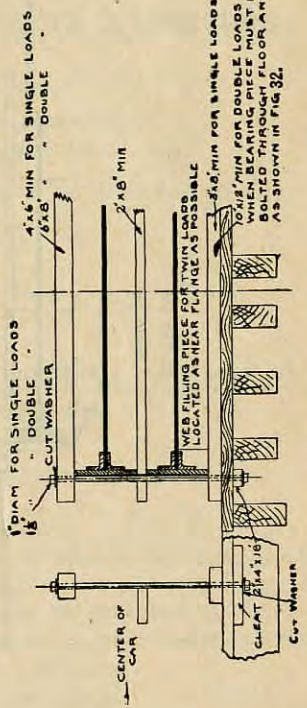


Fig. 31.
Rules 72 and 73.

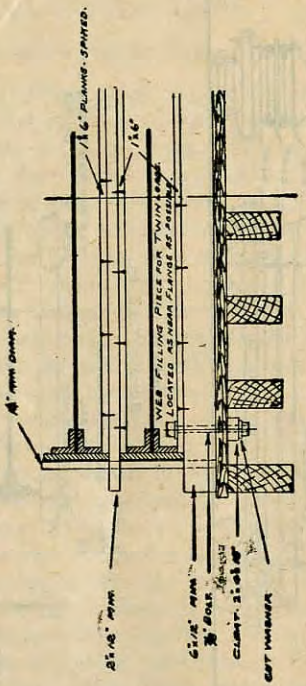


Fig. 32.
Rule 72.

Master Car Builders' Association

OFFICE OF SECRETARY,
1112 Karpen Building.

CHICAGO, ILL., November 20, 1917.

Circular No. 16 — 1917-1918.

From the Executive Committee — Revision of Loading Rules.

To the Members:

On account of the urgent necessity for utilizing all of the railway car equipment to the best advantage, the Committee on Loading Rules has submitted the following revision of the Loading Rules, which meets with the approval of the Executive Committee:

Change Rule 31 to read as follows:

RULE 31. If, in loading cars, it is impossible to clearly ascertain whether the restrictions given in General Instructions under paragraphs 8 and 15 are complied with, the following table may be used:

MAXIMUM WEIGHT OF LOAD.

FOR LOADS AS PER FIGS. 8, 9, 33, 34 AND 43.

Length of Car.	Length of Material.	Capacity of Car 60,000 lb.	Capacity of Car 80,000 lb.	Capacity of Car 100,000 lb.	Capacity of Car 110,000 lb.	Capacity of Car 140,000 lb.
30 ft.	30 ft.	57 000 lb.	76 000 lb.	.....	.....	.....
	32 ft.	53 000 lb.	71 000 lb.	.....	.....	.....
	34 ft.	49 000 lb.	65,000 lb.	.....	.....	.....
	36 ft.	45 000 lb.	60 000 lb.	.....	.....	.....
	38 ft.	41 000 lb.	52 000 lb.	.....	.....	.....
32 ft.	32 ft.	58 000 lb.	77 000 lb.	.....	.....	.....
	34 ft.	54 000 lb.	72 000 lb.	.....	.....	.....
	36 ft.	50 000 lb.	66 000 lb.	.....	.....	.....
	38 ft.	47 000 lb.	61 000 lb.	.....	.....	.....
	40 ft.	44 000 lb.	57 000 lb.	.....	.....	.....
34 ft.	34 ft.	57 000 lb.	76 000 lb.	93 000 lb.	.....	.....
	36 ft.	55 000 lb.	73 000 lb.	88 000 lb.	.....	.....
	38 ft.	51 000 lb.	69 000 lb.	83 000 lb.	.....	.....
	40 ft.	48 000 lb.	64 000 lb.	78 000 lb.	.....	.....
	42 ft.	45 000 lb.	60 000 lb.	73 000 lb.	.....	.....
40 ft.	40 ft.	.....	78 000 lb.	97 000 lb.	107 000 lb.	.....
	42 ft.	.....	73 000 lb.	92 000 lb.	101 000 lb.	.....
	44 ft.	.....	69 000 lb.	87 000 lb.	96 000 lb.	.....
	46 ft.	.....	66 000 lb.	83 000 lb.	91 000 lb.	.....
	48 ft.	.....	63 000 lb.	79 000 lb.	86 000 lb.	.....
42 ft.	42 ft.	.....	.....	98 000 lb.	108 000 lb	.....
	44 ft.	.....	.....	93 000 lb.	102 000 lb.	.....
	46 ft.	.....	.....	88 000 lb.	97 000 lb.	.....
	48 ft.	.....	.....	84 000 lb.	92 000 lb.	.....
	50 ft.	.....	.....	80 000 lb.	88 000 lb.	.....
44 ft.	44 ft.	.....	.....	98 000 lb.	108 000 lb.	138 000 lb.
	46 ft.	.....	.....	93 000 lb.	103 000 lb.	131 000 lb.
	48 ft.	.....	.....	89 000 lb.	98 000 lb.	125 000 lb.
	50 ft.	.....	.....	85 000 lb.	94 000 lb.	119 000 lb.
	52 ft.	.....	.....	81 000 lb.	89 000 lb.	114 000 lb.
46 ft.	46 ft.	.....	.....	99 000 lb.	109 000 lb.	139 000 lb.
	48 ft.	.....	.....	94 000 lb.	104 000 lb.	132 000 lb.
	50 ft.	.....	.....	90 000 lb.	99 000 lb.	126 000 lb.
	52 ft.	.....	.....	86 000 lb.	95 000 lb.	121 000 lb.
	54 ft.	.....	.....	82 000 lb.	91 000 lb.	116 000 lb.

RULE 53. "When dressed lumber is loaded in open or closed cars in two piles, the outside ends nearest the ends of the car must rest on bearing-pieces not less than 4 by 4 in. secured to car floor. See Rule 34 for size of stakes for open cars and the manner of tying them together at the top.

"If the shipper desires to do so, in order to prevent sap stains, for shipments of dressed lumber in open or closed cars, strips of rough lumber not more than 2 in. nor less than 1 in. thick, by not more than 6 in. nor less than 4 in. wide, may be placed crosswise between each layer of lumber. All strips over one and three-eighths (1⅜) in. thick must be six (6) in. wide. There must be one crosspiece to each pair of stakes on opposite sides of the car and between each layer of lumber. These strips must be of the same thickness for each layer of lumber, and must be neatly fitted between and butt against the stakes. When loaded as per Figs. 5, 7 and 9, the strips may be placed on the floor of the car as well as between the layers."

The following Rules 98-A, 98-B, 98-C, 98-D, 98-E, 98-F and 98-G, supersede present Rules 98-A and 98-B.

RULE 98-A. "Pig iron, billets, castings and material of similar character must, as far as practicable, be loaded in flat-floor gondola cars without drop doors, and the weight must be distributed equally over both bolsters or uniformly over the entire floor. Drop-end gondola cars must have the end gates raised and secured."

RULE 98-B. "If flat-floor gondola cars, having not to exceed twenty-five per cent of the floor surface provided with drop doors either flush with top of floor or bottom of sills, are used, the lading must be so loaded and interlaced that no portion of the same will fall or shift onto the drop doors in transit. If surface provided for drop doors exceeds twenty-five per cent of the floor

surface the doors must be boarded over with boards not less than 2 in. thick."

RULE 98-C. "Billets, axles and similar material 4 ft. long or over should be loaded lengthwise of the car in piles, one or two piles in each end of the car over the bolster and one in the center of the car between the drop doors, as per Fig. 62. Each pile in the ends of the car should have 2 in. or 3 in. dunnage strips extending full width of the car placed under the end of pile towards center of car and should be located 18 in. from end of pile. The pile in center of car must rest flat on car floor and should be centrally located between drop-door openings. When so loaded the drop doors need not be boarded over. Dunnage strips (optional), not less than 2 in. thick, may also be placed upright at sides of car between the billets and car sides to facilitate the application of chains or slings when unloading."

RULE 98-D. "Where the lading is not loaded in accordance with Rules 98-B or 98-C, the drop doors must be boarded over with not less than 2-in. boards secured to prevent shifting or by lading extending entirely across drop doors or resting on the side of the slope sheet, but in no case will it be permitted to rest on the drop doors. In all cases, drop doors must be properly closed and secured. The lading must be distributed over car floor, as provided for in Rule 98-A."

RULE 98-E. "When self-cleaning, flat-floor, drop-door gondolas or side-dump gondolas are selected, the door openings must be entirely boarded over with boards not less than 2 in. thick. Hopper cars or self-cleaning hopper cars must not be used for such shipments."

RULE 98-F. "When flat cars are selected, the lading must have end and side protection, consisting of boards

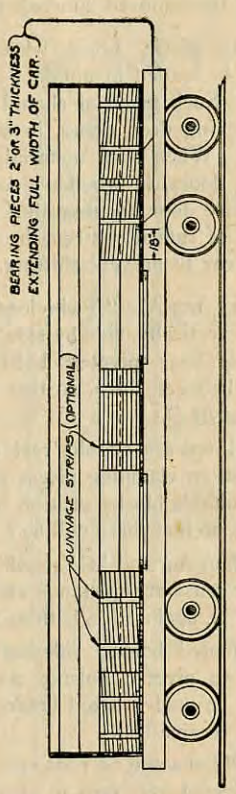


FIG. 62.
RULE 98-C.
MANNER OF LOADING BILLETS, AXLES AND SIMILAR MATERIAL
FOUR FEET LONG OR OVER, WITHOUT DOOR PROTECTION.

to the height of lading and at least 2 in. in thickness, placed against stakes, spaced not more than 6 ft. apart and of the required dimensions as per Rule 12."

RULE 98-G. Loose wheels and tires should preferably be loaded in gondola cars that do not have drop doors. Such material should not be loaded in gondola cars having drop doors, in steel floors, larger than the lading. When such material is loaded in gondola cars having doors, in wooden floors, larger than the lading, the entire door opening must be properly protected with boards of sufficient strength, securely nailed to the floor of the car to prevent shifting.

RULE 103-A. "Twin loads of roof trusses may be loaded vertically, side by side, provided they are clamped together near pivoted bolsters, with proper spacing pieces between them, so that they will act as one piece. See Fig. 67-B.

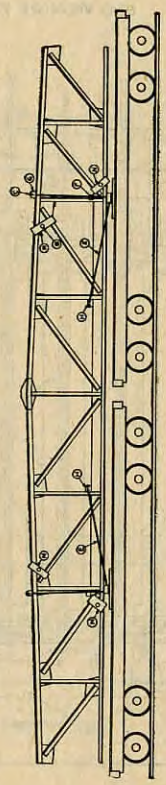
"All trusses should rest on pivoted bolsters. Top and bottom clamping pieces must rest on each truss or have suitable blocks secured between clamping piece and trusses, so that there will be a bearing on each truss.

" Clamping rod 'C' should bear against top flange of outside truss at top clamp, and rod 'D' in bottom clamp should be against the bottom flange of the outside truss.

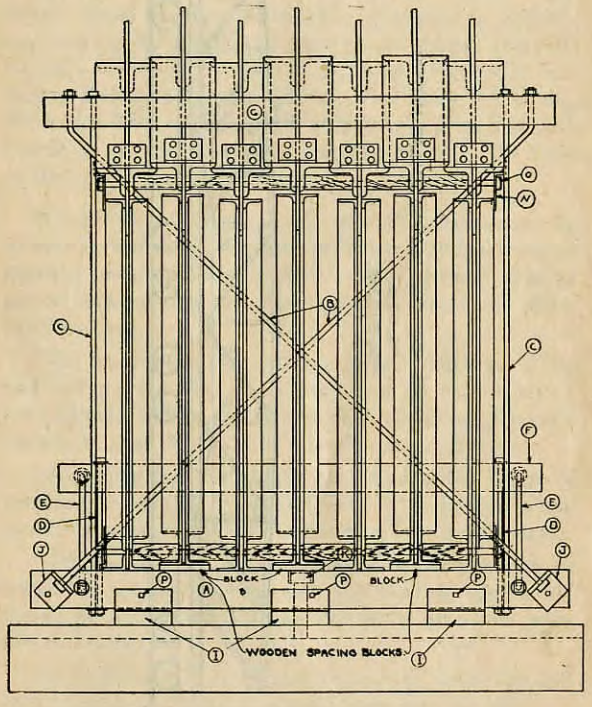
" Pivoted bolster side-bearing plate 'L' should be bolted to pivoted bolster, and side-bearing plate 'M' should be well greased before bolster is placed in position to receive load.

" All bolts and tie rods must be securely drawn up and ends riveted over nuts to prevent nuts working off.

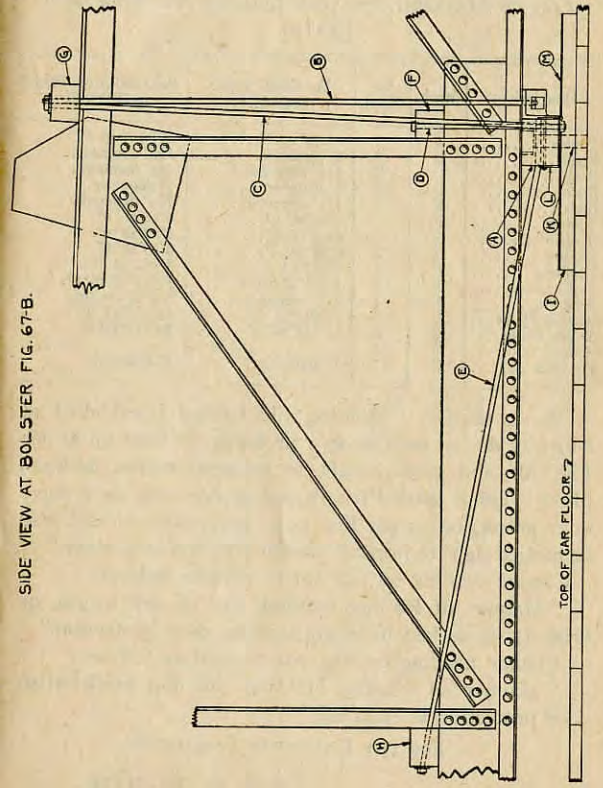
MANNER OF LOADING ROOF TRUSSES AND SIMILAR MATERIAL.
FIG. 67-B.
RULE 103-A.



END VIEW OF FIG. 67-B.



SIDE VIEW AT BOLSTER FIG. 67-B.



"The minimum dimensions of detail parts for different weights of lading are given in the following table:

LIST OF MATERIAL FOR ONE BOLSTER, TIE RODS AND PLATES.

Description.	Mark.	No. Reqd.	For Loads under 30,000 lbs.	For Loads from 30,000 to 72,000 lbs.
Timber	A	1	8″x10″x9′6″	10″x14″x9′ 6″.
Rods	B	2	1″ diameter	1⅛″ diameter.
Rods	C	2	1⅛″ diameter	1⅛″ diameter.
Rods	D	2	1″ diameter	1″ diameter.
Rods	E	2	1⅛″ diameter	1⅛″ diameter.
Timber	F	1	6″x6″x8′ 6″	6″x6″x8′ 6″.
Timber	G	1	6″x6″x9′ 0″	6″x8″x9′ 0″.
Timber	H	1	6″x8″x8′ 0″	6″x8″x8′ 0″.
Timber	I	3	3″x12″x4′ 6″	3″x12″x4′ 6″.
Angle Lug	J	2	½″x6″x6″x0′ 6″	½″x6″x6″x0′ 6″.
King Pin	K	1	2½″ diameter	2½″ diameter.
Bearing Plates	L	4	¼″x12″x1′ 2″	¼″x12″x1′ 2″.
Sliding Plates	M	2	⅜″x12″x4′ 6″	⅜″x12″x4′ 6″.
Plates	N	4		
Tie Rods	O	2	1″ diameter	1″ diameter.

RULE 124-B. "Building tile loaded interlocked at doorway do not require door protection if built up as per Fig. 101 and packed tight to prevent motion between tiling. Tiling loaded lengthwise at doorway must have door protection as per Fig. 102. Such tiling should also be packed tight to prevent motion between each other."

Change heading on Fig. 101 to read as follows:

"Manner of loading building tile of any length, or brick 15 in. or less in length without door protection."

Change heading on Fig. 102 to read as follows:

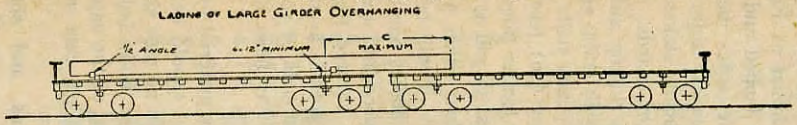
"Manner of loading building tile and brick when door protection is required."

FOR THE EXECUTIVE COMMITTEE,

JOS. W. TAYLOR,
Secretary.

FIG. 33.

Rules 11, 31, 73, 77 and 83.

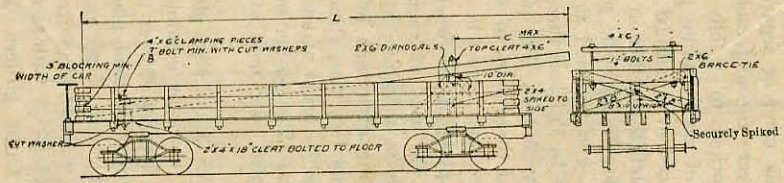


NOTE.— Brakes may be located as the load will permit.

FIG. 34.

Rules 11, 31, 73, 76, 77, 79, 80 and 84.

Overhanging loads on single cars.



NOTE.— Brakes may be located as the load will permit.

be SECURED TO CARRYING CAR, as described in paragraph 72 and Fig. 31.

74. When loading short structural material on single gondola cars, in separate piles, as shown in Fig. 36, the pieces forming each pile must be lapped and must be blocked to solidly fill the whole space between sides of car. Lading projecting above car sides must be placed in pyramidal shape, and opposite stakes must be fastened together at top by means of boards. Diagonal braces must be placed close to sloping sides of lading, and fastened at each side of each stake and tie boards by not less than three sixteen-penny nails. See Figs. 37 and 38. For piles up to twenty (20) feet long, at least three pairs of stakes, and for longer piles four pairs of stakes must be used. See Figs. 36 and 37.

In place of intermediate stakes, when either 3 or 4 stakes are used on each side of a pile, it will be permissible to substitute for each pair of stakes one clamp consisting of 4 inch by 6 inch top piece and two tie rods, not less than 1 inch in diameter, secured through floor in the usual manner, or to stake pocket, by means of metal plate washer or substitute, the ends of rods to be riveted over nuts after the clamp has been drawn tight.

74-A. Small steel plates and similar material loaded in box, stock or gondola cars, the load should be uniformly distributed over the car floor. In no case should the amount of load placed between the body bolsters and either end of car exceed 15 per cent of the capacity of cars with wood underframing and 20 per cent of the capacity of cars with steel underframing.

75. Open girders, half-roof trusses, and similar material loaded on gondola cars, as shown in Fig. 39, must rest on two bearing-pieces not less than six (6)

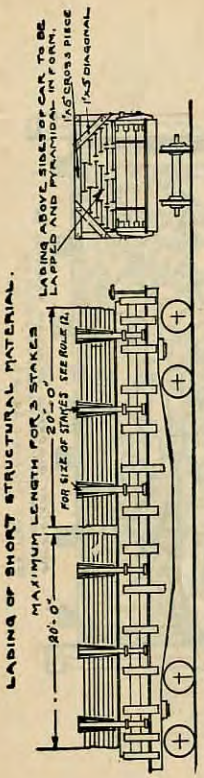


FIG. 36.
Rule 74.

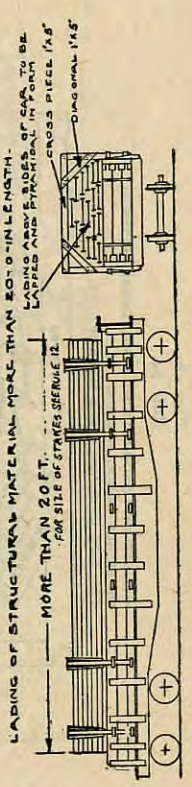


FIG. 37.
Rule 74.

FIG. 38.
Rule 74.

MANNER OF LOADING LIGHT STRUCTURAL MATERIAL
ON SINGLE GONDOLA CARS.
FOR SIZE OF STAKES SEE RULE NO. 12.

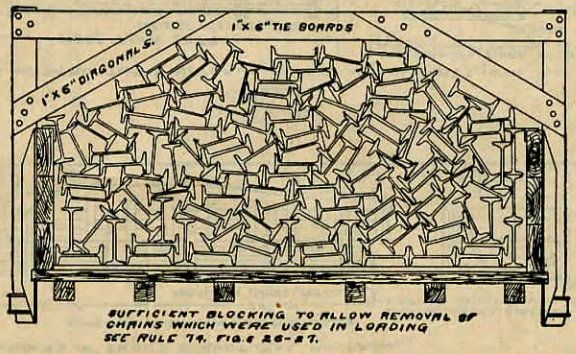
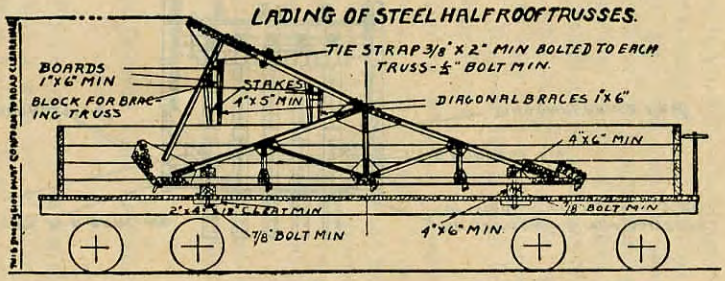
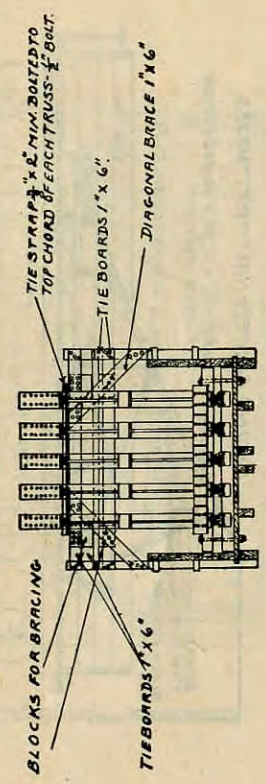


FIG. 39.
Rule 75.





End Elevation Fig. 39.

inches wide and four (4) inches thick. Two other timbers of same size must be placed above lower chord of trusses or girders, and securely bolted through bearing-pieces, floor and longitudinal cleat under floor. Load must be secured from shifting transversely by two stakes on each side, and opposite stakes fastened together by means of tie boards passing under and touching top chords of trusses or girders. Two blocks about a foot in length and of sufficient height to block outside girders must be securely nailed with not less than six ten-penny wire nails, between tie boards against outside girders. Diagonal braces must be fastened to stakes and cross-tie boards.

75A. Deep girders, whenever possible, should be loaded horizontally. Girders having a depth of more than two and one-half (2½) times the base, if loaded vertically, must be blocked apart to prevent overlapping of flanges and tied together to prevent independent side motion. See Fig. 40. This tying should be sufficiently strong and secure to practically combine all the girders so that they must act as one piece. In addition the load must be carefully blocked to prevent shifting sidewise or endwise.

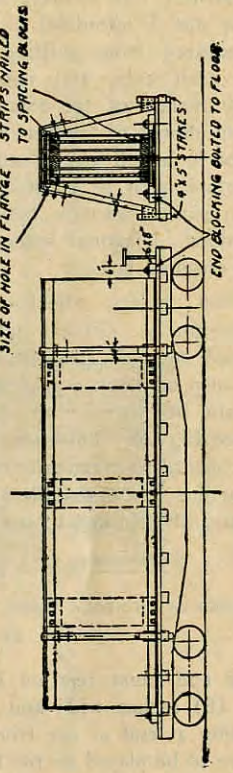
When Loaded in Gondola Cars, as Shown in Fig. 34 and Fig. 43.

76. One end must rest on bearing-piece not less than eight (8) inches wide and of sufficient depth to prevent lading at end of car from touching floor; the bearing-piece to be placed on the floor above the bolster and extending the width of car, and must be secured from shifting by cleats nailed or bolted to the floor. The end boards at this end of the car must be protected

FIG. 40.

MANNER OF LOADING DEEP GIRDERS ON FLAT CARS.

RULE 75-A.



by blocking fitted between the side boards so as to prevent any part of the load from injuring the end boards of the car. The thickness of the blocking may vary according to the weight of the lading, but should never consist of less than one three (3) inch plank set on edge for loads of less than one-half the capacity, nor less than two three (3) inch planks or their equivalent for loads of more than one-half (½) of the capacity of the car, and must be secured from shifting by cleats nailed or bolted to the floor.

77. If the OVERHANG (C) exceeds one-third (⅓) the total length (L) of load, as per Figs. 33 and 34, the opposite end must be securely bolted through bearing-piece to floor by means of seven-eighths (⅞) inch bolts.

78. If the DEPTH OF LOAD IS MORE THAN TWENTY-FOUR (24) INCHES, THE BRACING for clamping-piece on top of load must be the same as shown in Fig. 63.

79. If the lading which butts against the end boards consists of only a single piece or two of a weight not exceeding a total of six thousand (6,000) pounds, no end blocking is required.

80. When the lading consists of very FLEXIBLE MATERIAL, such as plates, no bearing-piece is required on the floor of the car, but blocking must be used to protect the end boards.

The other end of the load must rest upon a bearing-piece, square or round, preferably square, not less than eight (8) by ten (10) inches if square cornered, nor less than ten (10) inches in diameter if round, for loads of over one-half (½) the capacity, and proportionately smaller to less weight of lading. This bearing-piece must rest on the side boards of the car.

within one (1) foot of either side of the center line of the bolster, and must have the ends notched for the side boards and be securely braced to prevent both lateral and longitudinal motion, as well as bending and rolling. Figs. 41 and 42 show substantially how both bearing-pieces are to be made and secured.

81. If the total weight per bolster, Figs. 41 and 42, does not exceed 10,000 pounds, the center post and bolster cross braces may be omitted, provided the bearing-piece is not less than eight by ten inches (8 x 10 inches).

81-A. For twin loads of plates, structural bars and shapes with two bearing-pieces and two or four sliding-pieces, if the total weight does not exceed 20,000 pounds, or 10,000 pounds per bearing-piece, the center post and bolster cross braces may be omitted, provided the bearing-pieces are not less than eight by ten inches (8 x 10 inches).

81-B. For loads less in weight than those specified in paragraphs 81 and 81-A, the dimensions of bearing-pieces may be proportionately reduced as per Rule No. 29.

81-C. Plates too wide to be loaded flatwise in gondola cars may be loaded flat on flat cars, the load being held in place by 4 x 6 inch straight grain hardwood clamps, not less than six (6) feet apart, extending across car, substantially secured by ¾-inch bolts passing through the stake pockets. The plates must be so loaded that the ¾-inch bolts can be passed through stake pockets without being bent. This manner of loading is permissible only when the width of plates will not permit the use of standard stakes.

81-D. Plates too wide to be loaded flat on gondola or flat cars may be loaded diagonally on wooden gon-

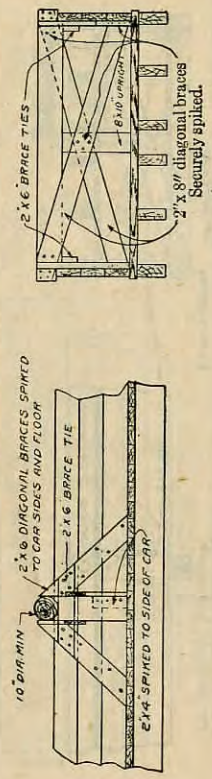


Fig. 41.
Rules 7, 80 and 81.
Manner of Blocking Round Bearing Pieces, Low Side Gondola Cars with Sides 3 in. or More in Thickness.

FIG 42
RULES 7, 80 & 81.
MANNER OF BLOCKING RECTANGULAR BEARING PIECES

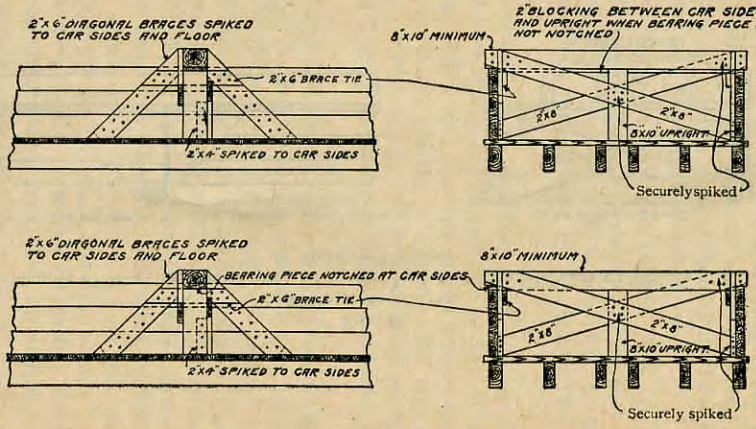
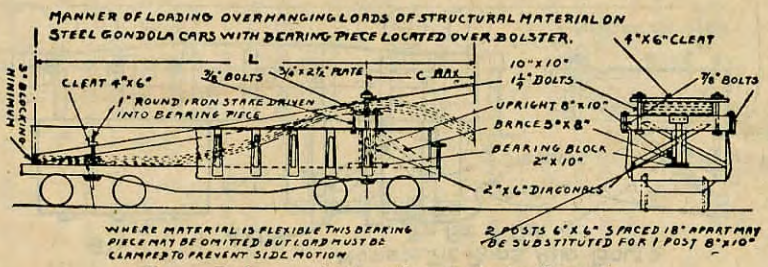


FIG. 43.
Rules 7, 11, 31, 76, 77, 79, 80 and 82.

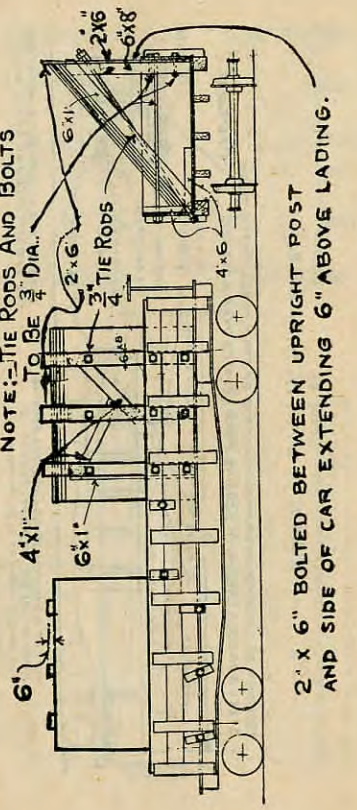


NOTE.— Brakes may be located as the load will permit.

FIG 44.

RULE. 81-D.

LOADING WIDE STEEL PLATES ON GONDOLA CARS.



dola cars, one side of the load resting on two bearing-pieces securely fastened to the car floor; on the same side of car two (2) straight grain hardwood pieces, 4 by 6 inches, to be securely fastened to car side, the other side supported by three (3) or more vertical straight grain hardwood posts, 6 by 8 inches in section, of sufficient height that when plates are placed diagonally across the car they will extend from one side across to full width of upright posts. These posts to be securely bolted to side of car with two (2) ¾-inch bolts, also secured by one diagonal rod not less than ¾ inch in diameter passing through each post within 8 inches of top and through opposite side of car 4 inches above car floor, and tied together with 1 by 4 inch hardwood boards, nailed to each vertical post with not less than three (3) ten-penny nails. Two (2) by six (6) inch hardwood timbers must be securely bolted between each upright post and side of car and extend six (6) inches above top of lading to prevent lading shifting sidewise. If the load is made up of two (2) tiers, one on each end of car, the total load must not exceed 75 per cent of the marked capacity of car. If the plates are too long to be loaded in two tiers, they may be loaded at the center of the car in one tier, the load not to exceed 50 per cent of the marked capacity of car. Fig. 44 shows substantially how bearing-pieces and braces are to be made and secured.

Short material may be loaded on car floor, if equally distributed over the entire floor; total load not to exceed the marked capacity of the car.

82. If the overhanging material is very flexible and interferes with the end boards of the adjacent car, a suitable sliding-piece protected by a strip of iron or steel must be placed on the adjacent car to support the

material. Sliding-piece may be placed on the sides or on the floor between the bolster and the end of the car used as an idler, but in no case should the load carried between the bolster and the end of the car exceed fifteen (15) per cent of the capacity of the car having wood underframing, and twenty (20) per cent of the capacity of the car having steel underframing.

When the overhang is flexible material and the weight on the post or posts is not excessive, 6 by 8 inch post or posts of sufficient length may be bolted to inside of end of the carrying car to support the overhang, in lieu of sliding-pieces placed on adjacent car.

83. The IDLERS used with loads as shown in Fig. 33 must be flat cars, unless the width of the overhanging load is at least three (3) feet six (6) inches less than the width given for each length of overhang in the table of paragraph 11, in which case a drop-end gondola car may be used.

84. The IDLER used with loads as shown in Fig. 34 may be a low-side gondola car, but must have at least four (4) inches clearance vertically between load and idler body or brake shaft.

LOADS ON SINGLE CARS, OVERHANGING BOTH ENDS OF CAR AS PER FIGS. 45, 46 AND 47.

85. This method of loading as shown by Figs. 45, 46 and 47, may be made use of to load long lattice girders, column, one-half roof trusses, and similar material, in length not to exceed 65 feet, overhang not to exceed 16 feet, height and width to conform to Rule 25, if the material would be injured if loaded on more than one car. From a point of safety in transit, it is a very undesirable method and should be used only when abso-

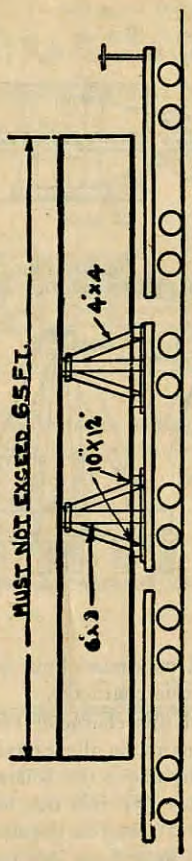


FIG. 45.
Rules 72, 85, 86, 87 and Figs. 46 and 47.
Manner of Loading Lattice Girders, Box Girders, Columns, one-half Roof Trusses and similar material. Rule 85 to be used only when absolutely necessary.
NOTE.— Brakes may be located as the load will permit.

FIG. 46.
Rules 72, 85, 86, 87 and Figs. 45 and 47.

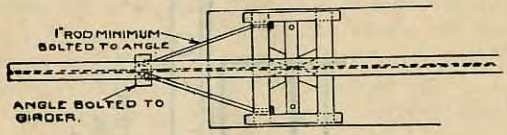
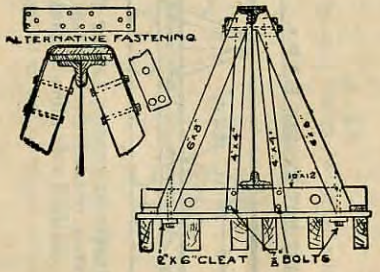


FIG. 47.
Rules 72, 85, 86, 87 and Figs. 45 and 46.



lutely necessary. A maximum limit of 80,000 pounds is placed on loads of this character.

86. For loads of this character FOUR BEARING-PIECES must be placed in pairs on the carrying car, each pair being placed centrally above the bolster, with a distance apart of not over five (5) feet nor less than three (3) feet; they must be fastened to the floor with bolts, and the upright supports must have side braces.

87. Braces or tie-rods must be secured to the over-

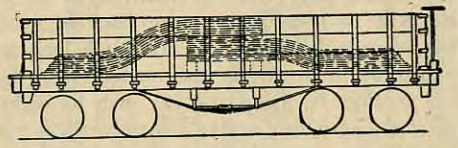
hanging ends and to the bearing-pieces, as shown in Fig. 46. Longitudinal motion must be prevented by the use of plates or clamps, as explained in paragraph 72.

LOADING FLEXIBLE PLATES ON SINGLE CARS.

88. Omitted in 1905.

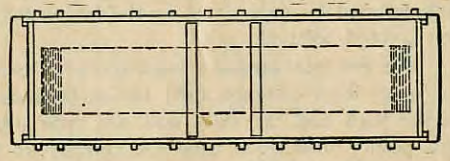
89. When plates are loaded on single cars, except

FIG. 48.
Rule 89.



all steel and steel underframe designs, and the lengths of the plates are such that it becomes necessary to lap the plates on each other at the center of the car, they

FIG. 49.
Rule 89.



must be braced to prevent shifting sidewise, and bearing-pieces not less than six (6) by eight (8) inches in section and in length corresponding to the distance between the sides, must be placed on the floor of the car above the cross-bearers to prevent the breaking

down of center sills and stringers, as shown in Figs. 48 and 49. Substantial blocking should be placed across end of car at end of load, to save end of car being cut by plates shifting endwise. Wooden underframe cars with two truss rods must not be loaded in this manner.

Twin Loads.

90. Material loaded on gondola cars with drop ends or on flat cars, as shown in Figs. 50 and 52, must have one bearing-piece not less than 10 by 10 inches (see also Rule 29) secured to the floor of each car with two ⅞-inch bolts, and lateral and longitudinal motion must be prevented in the manner described in Rule No. 72, Fig. 31, using six (6) inch by eight (8) inch top clamping-pieces and 1⅛-inch vertical rods if load does not exceed two (2) feet in height, measured from top of bearing-piece to top of load, and 1¼-inch vertical rods if load exceeds two (2) feet in height. When the lading consists of "I" beams, or similar material lying flat, and the load is 40,000 pounds or more per bearing-piece, or when there is danger of the flanges cutting into the bearing-pieces, the webs of such material must be supported by web pieces or the lading must be placed on pivoted bolsters.

91. When gondola cars are used for twin loads, a clearance of at least eighteen (18) inches on each side between the load and car sides and end gate stops at narrowest point; and when used for continuous triple loads at least thirty-nine (39) inches must be provided for curving. See Fig. 14.

Note.—As the specified clearances are to take care of road rather than terminal conditions, precautions should be exercised at terminals where short curves exist to prevent damage to sides of cars.

Fig. 50.
Rules 15, 29, 72 and 90.

Note.— Brakes may be located as the load will permit.

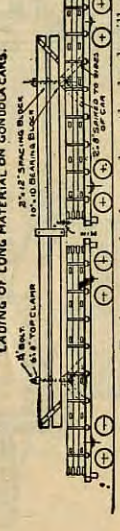


Fig. 51.
Rules 15, 81, 92 and 97.

Note.— Brakes may be located as the load will permit.

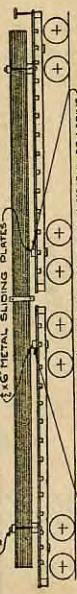


Fig. 52.
Rules 15, 29, 72, 90 and 93.

Note.— Brakes may be located as the load will permit.

FIG. 54.
RULES 7 AND 92.

TWIN SHIPMENTS ON GONDOLA CARS NOT EQUIPPED WITH DROP ENDS AND HAVING SIDES THREE OR MORE INCHES THICK.

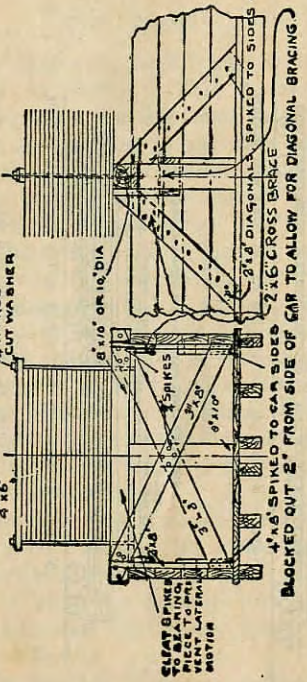


FIG. 57.
See Rule 92.

TWIN SHIPMENTS ON GONDOLA CARS NOT EQUIPPED WITH DROP ENDS

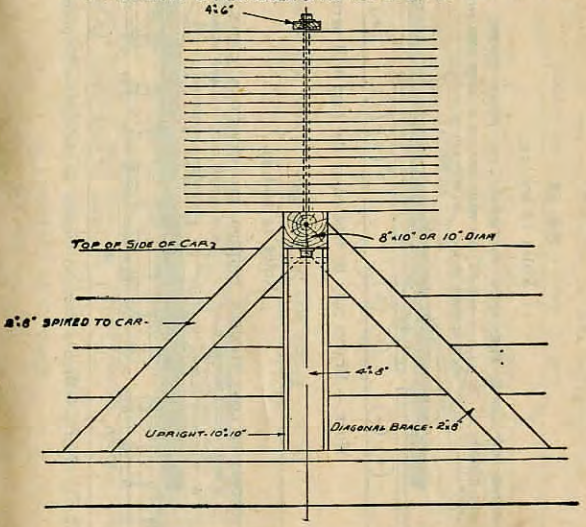
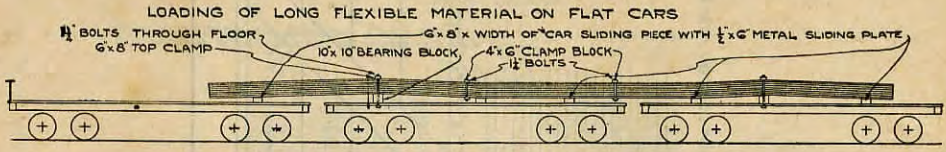


FIG. 58.

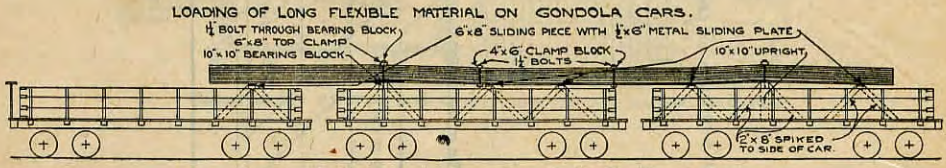
Rules 15 and 93.



NOTE.— Brakes may be located as the load will permit.

FIG. 59.

Rules 15 and 93.

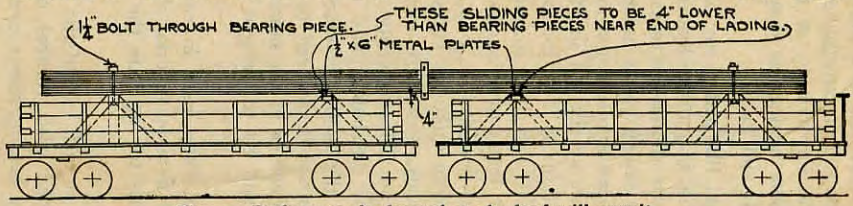


NOTE.— Brakes may be located as the load will permit.

FIG. 60.

Rules 15, 92, 93, 94 and 97.

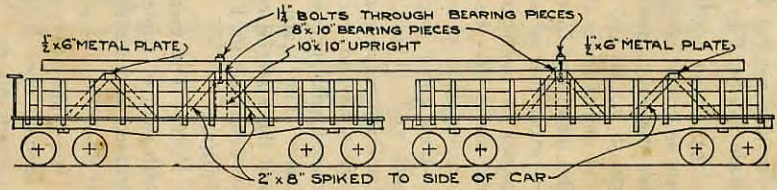
LADING OF LONG FLEXIBLE MATERIAL ON GONDOLA CARS NOT HAVING DROP ENDS.



NOTE.— Brakes may be located as the load will permit.

FIG. 61.

Rules 15, 81, 92, 93, 96 and 97.



NOTE.— Brakes may be located as the load will permit.

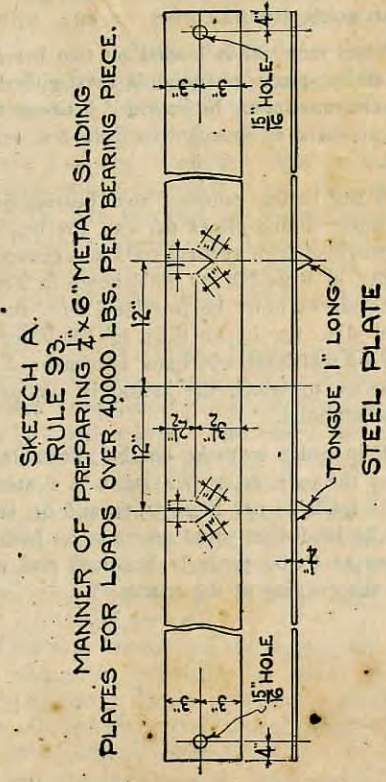
92. Material loaded on gondola cars without drop ends, as shown in Figs. 51, 60 and 61, must have bearing-pieces placed on top of the side boards, of the same size and secured in the same manner as described in Rule No. 81, Figs. 41, 42, 51 and 54.

93. Long flexible material, like plates, etc., which can not be loaded as shown in Fig. 34, must be loaded on two bearing-pieces, and two or more sliding-pieces as in Figs. 52, 58, 59, 60 and 61. The sliding-pieces must be four (4) inches lower than the bearing-pieces and must have flat metal one-fourth (¼) in. by six (6) in., for loads of 40,000 lbs. or less, and ½ in. by 6 in. for loads over 40,000 lbs. per bearing-piece (¼ in. by 6 in. metal sliding plates may be used for loads over 40,000 lbs. per bearing-piece, if prepared as per sketch "A"), secured to their upper sides either with spikes or lag screws at each end. These metal pieces, which are intended to facilitate curving, must extend at least twenty-two (22) inches beyond each side of the lading and must be coated with grease before the lading is placed upon them. The bearing-pieces must be secured to the car and the material clamped together in the same manner as described in Rules 72 and 80 to prevent it from shifting.

NOTE.— The metal sliding plates used in connection with twin or triple loads of flexible material should be greased at interchange points to facilitate the curving of the cars.

94. The BEARING-PIECES at each end of the load are the only ones to be provided with vertical rods and clamping-pieces. When the bearing-pieces are located near the center of the cars, as is the case with the end pieces in Fig. 60, and when the load so carried is equal

SKETCH A.
RULE 93.
MANNER OF PREPARING ¼"×6" METAL SLIDING PLATES FOR LOADS OVER 40000 LBS. PER BEARING PIECE.



to one-half (½) the capacity or over, the clamping-pieces must be secured with lateral bracing-pieces, as shown in Fig. 63, to prevent the breaking down of the sides when going around curves.

95. When material is loaded on two bearing-pieces and two sliding-pieces on gondola cars with drop ends, the same clearance must be provided between the lading and the car sides, as specified in Rule No. 91, Figs. 14 and 14-A.

96. If the lading requires two bearing-pieces and three or more sliding-pieces per car, the bearing-pieces must be provided with vertical rods and clamping-pieces as described in Rule No. 72 and shown in Fig. 61, and the sliding-pieces must be provided with flat iron or steel secured to the upper sides to allow for curving. For loads of this kind, overhang is measured from the bearing-pieces, to which the lading is clamped, to the end of the material.

97. If, in order to make up the allowable carrying capacity of the cars, SHORT MATERIAL IS LOADED ON THE FLOOR, with loads as per Figs. 51, 60 and 61, such material must be loaded in equal amounts on both sides of the car, so as to be properly balanced and not interfere with the curving of the trucks.

RULES GOVERNING THE LOADING OF ROLLED MATERIAL OF SMALL SECTIONAL AREA, SHORT BILLETS, SMALL CASTINGS, WHEELS AND TIRES ON OPEN CARS.

SINGLE LOADS.

98. Rails, bar-iron, channels, angles, etc., should, whenever possible, be loaded on SINGLE GONDOLA CARS INSIDE OF END GATES, which must, in all cases, be raised and securely fastened. Rolling freight must be loaded longitudinally with car and must be substantially chocked with side blocking in height equal to one-seventh (1/7) the diameter of rolls, provided that blocking of more than ten (10) inches in height will not be required. End blocking to be not less than four (4) inches in height.

98A. Pig iron, short billets, small castings, and material of similar character, should, as far as practicable, be loaded in flat floor gondola cars, and the door openings need not be boarded over. The lading, however, must be loaded over the bolsters. But should a few pieces not exceeding one layer in depth shift over doors in transit, be the doors either flush with top of floor or bottom of sills, the shipment will be considered acceptable provided the doors and door mechanism are in good condition. Drop-end gondola cars must have the end gates raised and secured.

When flat cars are selected the lading must have end and side protection, consisting of plank of sufficient height and at least 2 inches in thickness placed against stakes spaced not more than 6 feet apart, and of the required dimensions as per Rule 12.

When self-cleaning gondolas, side dump gondolas, hopper cars or self-cleaning hopper cars are selected, the doors must be securely boarded over as per Fig. 62.

FIG. 62

RULE 98-A.

DIAGRAM OF HOPPER BOTTOM CAR, SHOWING THE APPLICATION OF FALSE BOTTOM FOR THE LOADING OF PIG IRON BILLETS, SMALL CASTINGS ETC.

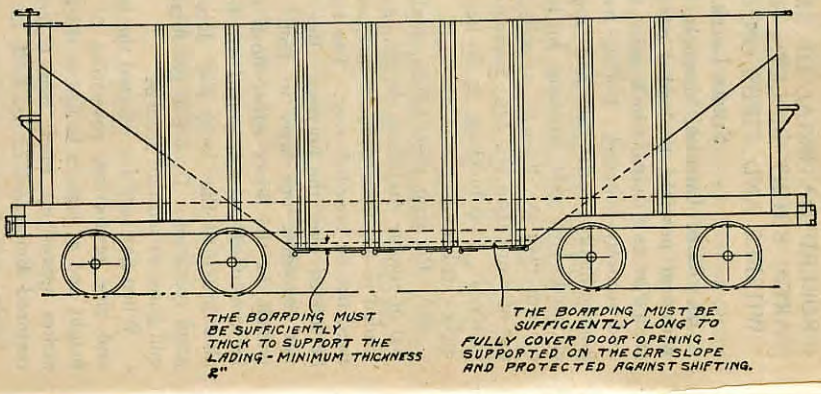
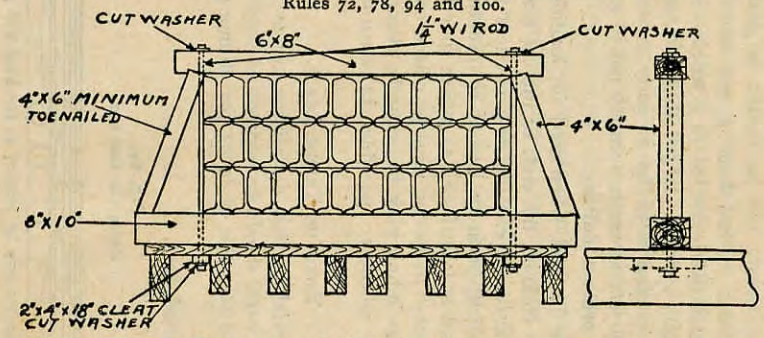


FIG. 63.

STRUCTURAL MATERIAL LOADED ON FLAT CARS OR ON TOPS OF SIDES OF GONDOLA CARS

Rules 72, 78, 94 and 100.



NOTE.—When loading on top of the sides of gondola cars, these bolts to extend through bearing-piece only.

98B. Loose wheels and tires should preferably be loaded in gondola cars that do not have drop doors. Such material should not be loaded in gondola cars having drop doors, in steel floors, larger than the lading. When such material is loaded in gondola cars having doors, in wooden floors, larger than the lading, the entire door opening must be properly protected with boards of sufficient strength, securely nailed to the floor of the car to prevent shifting.

99. Single flat cars, when used for loading material referred to in Rule 98, the ends of the car must be provided with hardwood end blocking not less than three (3) inches thick, securely braced to prevent shifting lengthwise, and at least four (4) stakes four (4) inches by five (5) inches in section must be placed on each side of car, or the lading may be securely clamped to the floor of car whenever possible, in accordance with Fig. 31.

Twin or Triple Loads.

100. Material of this description, when loaded on two or more cars, should be secured as shown in Figs. 63, 64, 65 and 66. See Rule 93 for sliding-pieces and sliding-plates.

101. Omitted, 1913.

Fig. 64.
Rules 100 and 102.

Note.— Brakes may be located as the load will permit.

102. When loaded on two or more cars, the material must be fastened at the center by means of two vertical pieces of timber not less than four (4) inches

by five (5) inches in section, held together by means of two 1-inch rods, as shown in Figs. 64 and 66.

103. Girders more than four (4) feet high, loaded on two or more cars in a vertical position, must be loaded on pivoted bolsters shown in Figs. 67 and 68. The bracing shown is for long girders. For other material the bracing must be equally strong.

Two or more girders may be loaded vertically, side by side, provided they are bolted together near pivoted bolsters, with proper spacing-pieces between them, in such a manner that they act as one girder.

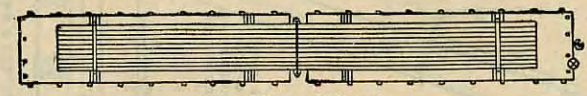
104. The minimum dimensions of detail parts for different weights of lading are given in following table.

LIST OF MATERIAL.

NAME.	Designation.	No. Wanted.	For girders weighing not more than 30,000 lbs.	For girders weighing more than 30,000 lbs. and not exceeding 72,000 lbs.	For girders weighing more than 72,000 lbs. and not exceeding 115,000 lbs.	For girders weighing more than 115,000 lbs., and not exceeding 200,000 lbs.
Bolster	A	1	8″x10″wide x 9′6″	10″x14″wide x 9′6″	12″x16″wide x 9′6″	14″x20″ or its equivalent in steel
Struts	B	2	*6″x8″	*6″x10″	*6″x12″	*8″x12″
Center plate backing	C	1	3″x12″x5′	3″x12″x5′	3″x12″x5′	4″x12″x5′
Side bearing backing	D	2	3″x10″x5′	3″x10″x5′	3″x10″x5′	4″x10″x5′
Bolster side stops	E	2	†x10″x2′	†x10″x2′	†x10″x2′	†x10″x2′
Side bearing plate, bottom	F	1	6″x$\frac{3}{8}$″x3′6″	6″x$\frac{3}{8}$″x3′6″	6″x$\frac{3}{8}$″x4′	6″x$\frac{1}{2}$″x4′
Side bearing plate, top (bent)	G	1	6″x$\frac{1}{4}$″x1′3″	6″x$\frac{1}{4}$″x1′7″	6″x$\frac{1}{4}$″x1′9″	6″x$\frac{3}{8}$″x2′1″
Center plate, bottom	H	1	12″x$\frac{3}{8}$″x12″	12″x$\frac{3}{8}$″x12″	12″x$\frac{3}{8}$″x12″	12″x$\frac{3}{8}$″x12″
Center plate, top	J	1	12″x$\frac{3}{8}$″x12″	12″x$\frac{3}{8}$″x12″	12″x$\frac{3}{8}$″x12″	12″x$\frac{3}{8}$″x12″
Center pin	K	1	2$\frac{1}{4}$″ diam.	2$\frac{1}{2}$″ diam.	2$\frac{1}{2}$″ diam.	2$\frac{1}{2}$″ diam.
Strut Straps	L	4	5″x$\frac{3}{8}$″x1′6″	5″x$\frac{3}{8}$″x1′6″	5″x$\frac{3}{8}$″x1′6″	5″x$\frac{3}{8}$″x1′6″
Strut angles	M	2	3$\frac{1}{2}$″x5″x$\frac{3}{8}$″x9$\frac{3}{4}$″ long	3$\frac{1}{2}$″x5″x$\frac{3}{8}$″x13$\frac{1}{2}$″ long.	3$\frac{1}{2}$″x5″x$\frac{3}{8}$″x15″ long.	3$\frac{1}{2}$″x5″x$\frac{3}{8}$″x18″ long
Flange clamps	N	2	6″x$\frac{3}{4}$″x1′4″	6″x1″x1′4″	6″x1″x1′4″	6″x1$\frac{1}{8}$″x1′4″
Brace rods	O	2	1″ rod or 2$\frac{1}{2}$″x$\frac{1}{4}$″ flat.	1$\frac{1}{8}$″ rod or 3″x$\frac{1}{4}$″ flat	1$\frac{1}{4}$″ rod or 3″x$\frac{5}{8}$″ flat.	1$\frac{1}{2}$″ rod or 3″x$\frac{3}{4}$″ flat
Bolts for center plate backing	P	6	$\frac{3}{4}$″ diam.	$\frac{7}{8}$″ diam.	$\frac{7}{8}$″ diam.	$\frac{3}{4}$″ diam.
Bolts for flange clamps	Q	4	$\frac{3}{4}$″ diam.	$\frac{7}{8}$″ diam.	$\frac{7}{8}$″ diam.	$\frac{7}{8}$″ diam.
Bolts for strut straps	R	8	$\frac{3}{4}$″ diam.	$\frac{7}{8}$″ diam.	$\frac{7}{8}$″ diam.	$\frac{7}{8}$″ diam.
Bolts for strut angles	S	4	$\frac{3}{4}$″ diam.	$\frac{7}{8}$″ diam.	$\frac{7}{8}$″ diam.	$\frac{7}{8}$″ diam.
Bolts for strut tops	T	4	$\frac{7}{8}$″ diam.	$\frac{7}{8}$″ diam.	1″ diam.	1″ diam.
Strut top irons	U	2	6″ channels, or angle, 4′10″ long	6″ channels, or angle, 4′10″ long.	6″ channels, or angle, 4′10″ long.	6″ channels, or angle, 4′10″ long

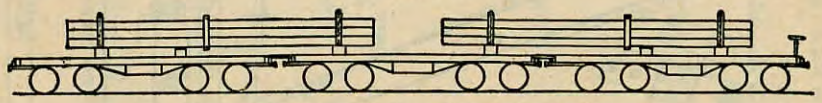
*May be made of two pieces, securely bolted together. †To be $\frac{1}{8}$″ less than flange of girder.

FIG. 65.



Plan View of Fig. 64.

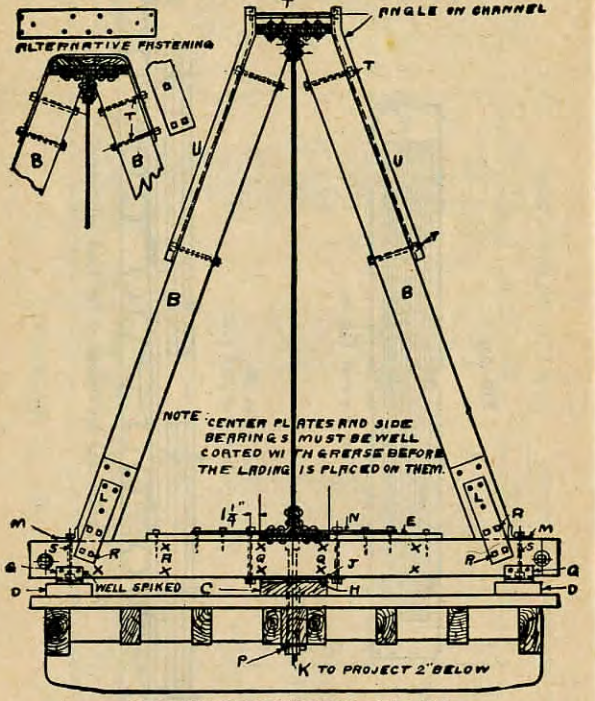
FIG. 66.
Rules 100 and 102.



NOTE.— Brakes may be located as the load will permit.

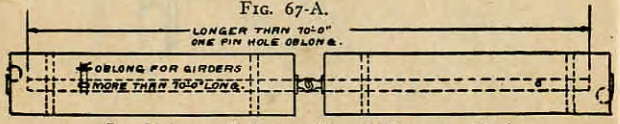
FIG. 67.

See Rules 103 and 104, and Figs. 68 and 69.



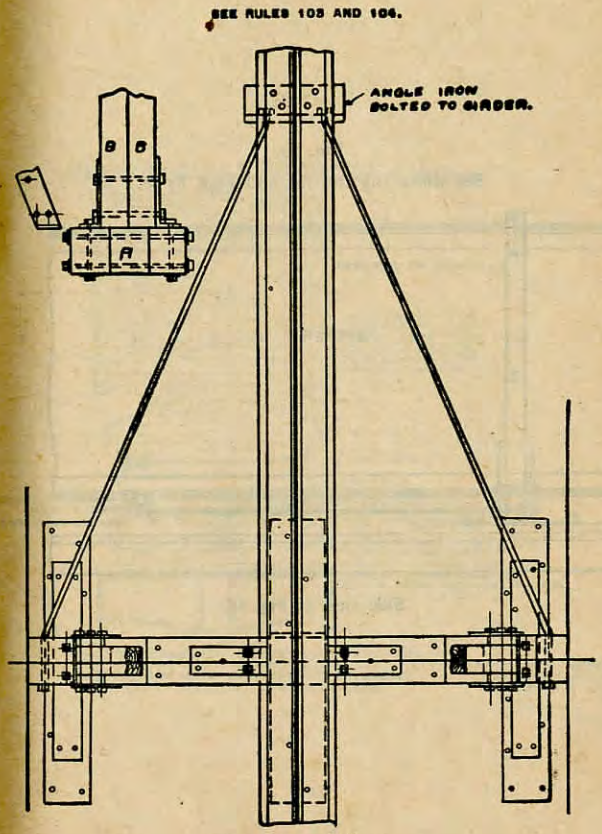
FOR DIMENSIONS SEE TABLE RULE 104.

FIG. 67-A.



See Rule 104-B, Letter F, and Figs. 67, 68, 69.

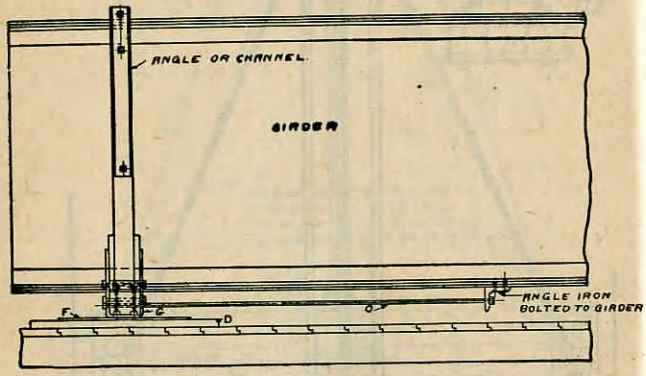
FIG. 68.



Plan view of Fig. 67.

FIG. 69.

See Rules 103 and 104 and Figs. 67-68.



Side view of Fig. 68.

FIG. 70.

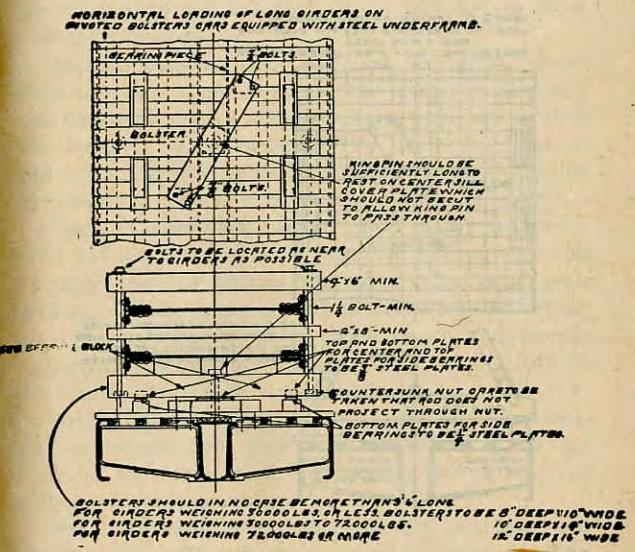
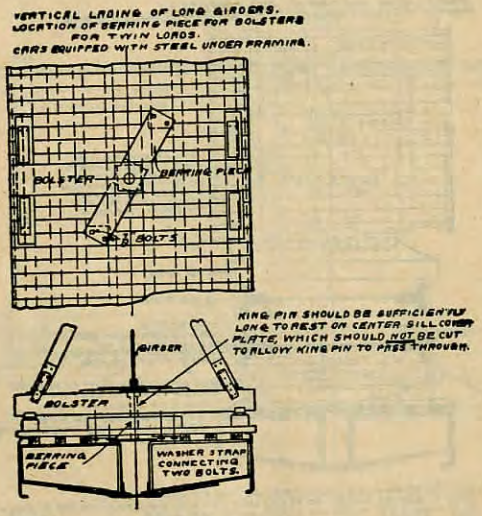


FIG. 71.



104A. Struts must be neatly fitted and driven into place.

104B. If the diagonal brace rods at one end are attached to girder between bolsters, those at the other end must likewise be attached to girder between bolsters, or brace rods at both ends may be attached to overhanging ends of the girders. See Figs. 67, 68 and 69.

104C. Bolts through rivet holes in girder should be not more than one-sixteenth (1-16) inch less in diameter than the holes.

104D. Bolsters, when made of one piece, should have transverse bolts not less than ¾ inch in diameter, one to either side of the center pin, to avoid splitting the bolster. When made of two or three pieces, as per notes I and K, must be securely fastened together by means of bolts in location marked (X), Fig. 67.

104E. Center-plate backing should have transverse bolts not less than ⅝ in. in diameter, one on each side of center pin, to prevent the splitting of center-plate backing. Filling-pieces should be placed between stringers on wooden cars, of the same length and directly underneath center-plate backing. Six bolts should be used to tie the two pieces together.

104F. For girders more than seventy (70) feet long, one center-pin hole should be made oblong, in car body, as shown in small diagram, permitting two (2) inches longitudinal motion.

104G. Girders more than eight (8) feet deep, and weighing less than thirty thousand (30,000) pounds, should have bolster equipment specified for girders weighing more than thirty thousand (30,000) pounds and less than seventy-two thousand (72,000) pounds.

104H. For girders more than fifty (50) feet long, if necessary to pass a curve of more than twenty (20)

degrees curvature, nuts on one bolster should be loosened to allow girder to shift on bolster. After curve is passed the original firm condition must be restored.

104I. The ten (10) by fourteen (14) inch bolster may be built up of two pieces ten (10) inches deep by seven (7) inches wide, or a bolster eight (8) inches deep and twenty (20) inches wide made of two pieces eight (8) by ten (10) inches may be substituted.

104K. The twelve (12) by sixteen (16) inch bolster may be built up of two pieces twelve (12) inches deep and eight (8) inches wide. A bolster ten (10) inches deep by twenty-four (24) inches wide made of three pieces ten (10) by eight (8) inches, or a bolster eight (8) inches deep by thirty-six (36) inches wide made of three pieces eight (8) by twelve (12) inches, may be substituted.

RULES GOVERNING THE LOADING OF TURNTABLES.

105. Turntables may be loaded either RIGHT SIDE UP, as shown in Fig. 73, or UPSIDE DOWN, as shown in Fig. 72.

106. Each turntable, when loaded right side up, must rest on two cribbings made of timber not less than ten (10) inches square, notched and securely bolted with seven-eighths (7/8) inch bolts.

107. The LOWER TRANSVERSE TIMBERS of the cribbing must extend the full width of the car, and must be bolted to the car floor, between the stringers, with one seven-eighths (7/8) inch bolt at each end of each timber. Underneath the floor must be placed boards two (2) by six (6) inches in section, and of sufficient length to allow all the bolts on a side to pass through a board.

108. When the height of the cribbing will be sufficient by the use of one transverse and one longitudinal course of timbers besides the bolster which is secured to the table, the TRANSVERSE TIMBERS on the floor, of which there should not be less than two, should be placed not less than eighteen (18) inches apart, and the three top timbers must be notched in between the floor timbers, as shown in Fig. 73.

When the required height of the cribbing makes it necessary to use three or more courses of timber, the distance between the floor timbers must be correspondingly increased.

109. Turntables loaded on two or more cars forming TWIN LOADS must rest on pivoted bolsters, which must be firmly fastened to the turntable. The bolsters, center plates, center pins and side bearings must conform to dimensions given in table of paragraph 104.

110. The BOLSTERS may be held to the TURNTABLE either in the manner shown in figure, or if rivet holes are available in the lower flanges, it may be held with four three-fourths (3/4) inch bolts at each end. They must also be secured to the cribbing by a center pin two and one-half (2½) inches in diameter, passing through bolster, center plates and top timbers of cribbing.

111. The BOLSTER SUPPORT on car must not be less than six (6) inches deep by eighteen (18) inches wide and must be securely fastened to car floor with two seven-eighths (7/8) inch bolts at each end, or the support may be made as shown for long girders.

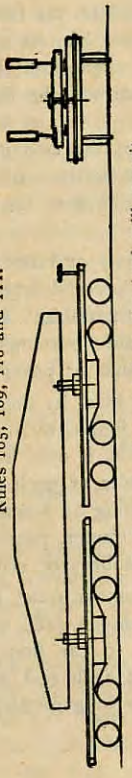


FIG. 72.
Rules 105, 109, 110 and 111.

NOTE.— Brakes may be located as the load will permit.

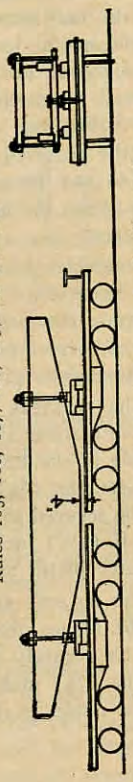


FIG. 73.
Rules 105, 106, 107, 108, 109, 110 and 111.

NOTE.— Brakes may be located as the load will permit.

RULES GOVERNING THE LOADING OF PIPE ON OPEN CARS.

(For size of stakes, see Rules 12 and 13.)

112. GENERAL INSTRUCTIONS WITH RESPECT TO WIRING AND STAKING.— There should be not less than three pairs of stakes to each pile, when the material is twenty-three feet or less in length, the top of each pair of stakes to be held together by means of six strands equal to three wrappings of good ⅛-inch diameter wire resting on the pipe, in addition to any intermediate wiring or dunnage strips for character of shipments, as provided for in succeeding paragraphs. Intermediate wiring need not be used when load is less than three feet above car sides. If pipe is more than twenty-three feet long, there must be at least four pairs of stakes, but where dunnage strips are used between consecutive layers of pipe three pairs of stakes should be sufficient.

If pipe eight (8) feet or less in length is loaded above the end or end gates of car, side and end protection must be provided.

112-A. GONDOLA CARS.— Wrought-iron pipe 12 inches or less in diameter should be loaded in gondola cars. Gondola cars loaded higher than 3 feet above top of sides with wrought-iron pipe 12 inches or less in diameter should have the stakes pulled together after pipe has been loaded to top of sides, by means of a rod with turnbuckles or any other suitable means, until the side stakes are slightly inclined toward center of car. Opposite stakes should then be secured by wire at height of car sides, and further loading of pipe should be placed on this wire. Top of stakes should again be secured by wire, as provided for in General Rule No. 112. Where

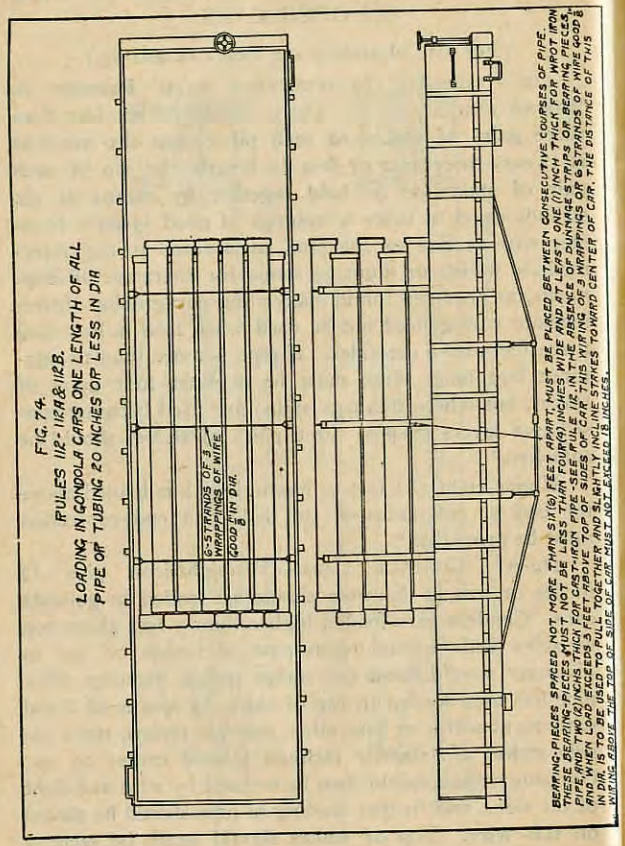
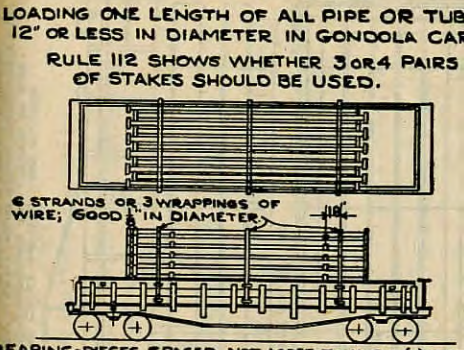


FIG. 74.
RULES 112-112A & 112B.
LOADING IN GONDOLA CARS ONE LENGTH OF ALL PIPE OR TUBING 20 INCHES OR LESS IN DIA

FIG. 75.
Rules 112 and 112-A.



facilities do not make it possible to properly apply the intermediate wiring, bearing-pieces not less than 4 inches wide and 1 inch thick, spaced not more than 6 feet apart, may be placed between consecutive courses of pipe. Each course of pipe should be securely blocked on both sides to prevent rolling.

Wrought-iron pipe of the smaller sizes, approximately 1½ inches in diameter and less, should not be loaded inside of larger sizes of pipe, unless below the ends or end gates of cars.

Wrought-iron pipe of the smaller sizes, approximately 1½ inches in diameter and less, should not be loaded on top of the larger sizes of pipe, unless the load is below the ends or end gates of cars, except where the smaller pipe is securely tied in bundles.

FIG. 76.
RULES 112 & 112-A.
LOADING IN GONDOLA CARS TWO LENGTHS OF ALL PIPE OR TUBING 12 INCHES OR LESS IN DIA. X 23 FEET OR LESS IN LENGTH

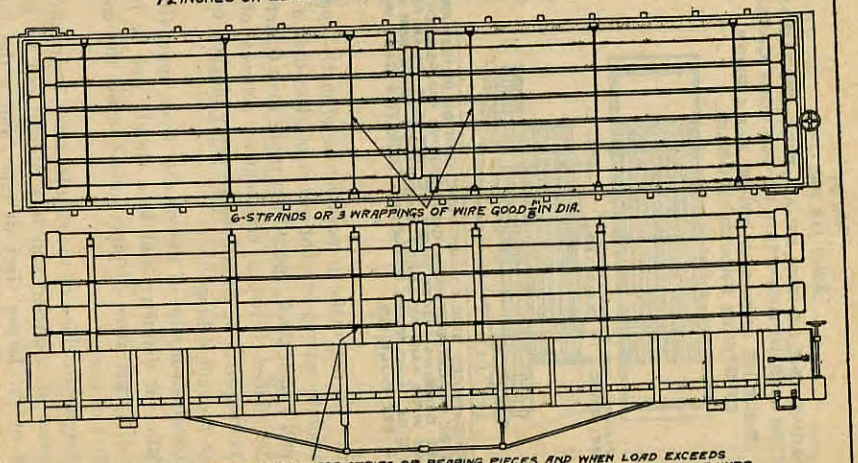
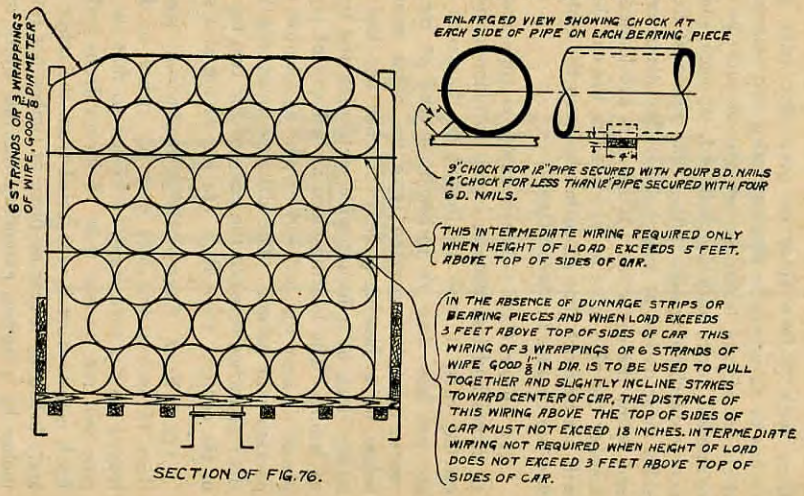


FIG. 77.
RULES 112 AND 112-A.
LOADING IN GONDOLA CARS OF ALL PIPE OR TUBING 12 INCHES OR LESS IN DIA. X 23 FEET OR LESS IN LENGTH.



SECTION OF FIG. 76.

112-B. GONDOLA CARS.— Cast-iron pipe, 12 inches or less in diameter, should be loaded in gondola cars. Cars with 30-inch sides or over may have pipe 10 inches or 12 inches in diameter piled two courses above the sides of cars, but these two courses must be piled in pyramidal form, with the bell ends of each succeeding course overlapping each other. The pipe next to the car sides must extend at least one-half the diameter at bell end below the car sides. When cars are loaded in this manner the pipe must be so loaded in the car that there will not be more than 24 inches between the ends of the two top courses in the center.

113. FLAT CARS.— When cast-iron pipe more than 12 inches and less than 24 inches in diameter is loaded on flat cars, it must be loaded so that ends of pipe are not less than 18 inches from end of car. Each course must be separated from the other immediately below by a bearing-piece of timber not less than 2 inches thick by 4 inches wide, extending the full width of lading. The bearing-piece at bell end of pipe to be placed as near the bell end of pipe as location of stake pockets will permit. The distance must not be more than 24 inches between the ends of the two top courses in the center. (See Rule 112 for wiring and staking.)

114. FLAT CARS.— All wrought-iron pipe more than 12 inches and less than 24 inches in diameter, loaded on flat cars, must be loaded so that the ends of pipe will not be less than 18 inches from end of car. Each course must be separated from the other immediately below by a bearing-piece of timber not less than 2 inches by 4 inches, extending the full width of lading. The bearing-piece at sleeve end of pipe to be placed as near the sleeve end of pipe as location of stake pockets

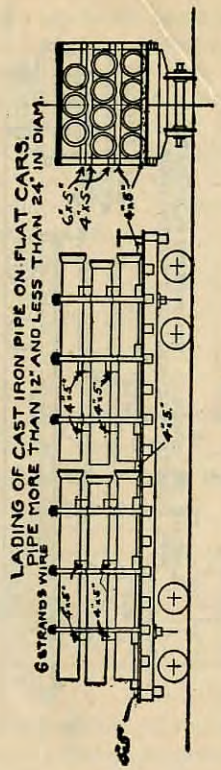


FIG. 78.
Rule 113.

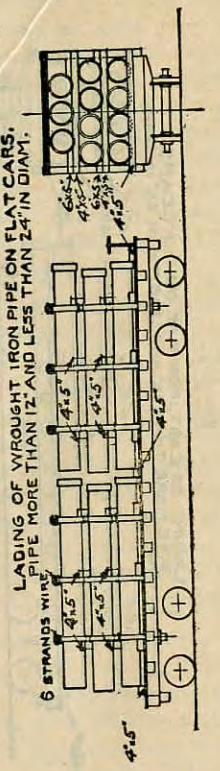


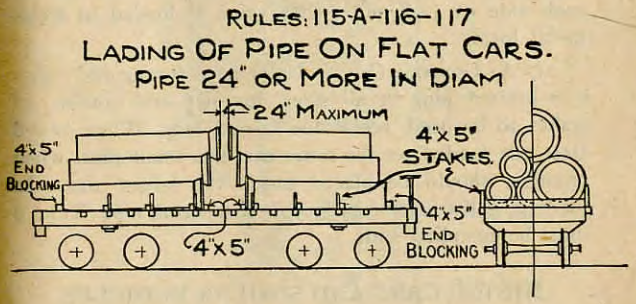
Fig. 79.
Rule 114.

on the car will permit. (See Rule 112 for wiring and staking.)

115. Gondola Cars.— All cast-iron pipe 12 inches and including 24 inches in diameter, when loaded in gondola cars, must have the bell ends overlapping each other. The bell ends of the pipe next to the car sides must extend at least 5 inches below the side of car. Additional courses may be loaded on the car in pyramidal form. The top courses of pipe on the two piles must not be more than 24 inches apart in the center.

115-A. Gondola and Flat Cars.— All wrought or cast iron pipe 24 inches or more in diameter must be loaded in pyramidal form, with the bell ends interlocking each other. The ends of bottom pipe must not be

Fig. 80.



less than 18 inches from end of car on flat cars, and 6 inches from the end plank on gondola cars. The bell or sleeve ends of the top courses must overlap those of the courses immediately below and the top courses not be more than 24 inches apart in the center. The bottom course must be securely blocked on each side of each

pile with not less than three blocks, 8 inches long and of a height equal to one-quarter the diameter of the pipe, provided that blocking more than ten (10) inches in height will not be required. The blocks must be neatly fitted to the pipe, shouldered and beveled on the outside and secured against displacement. Each end of bottom course must be provided with end blocking not less than 4 inches by 5 inches in section, securely fastened to the floor of car when pipe is loaded on flat cars. (See Rule 112 for wiring and staking.)

116. BLOCKING of more than ten (10) inches in height will not be required, but on loads of pipe three (3) feet or over in diameter the blocking must be stayed by suitable chocking.

117. There must be three STAKES not less than fifteen (15) inches high above the floor of the car on each side of each pile, where pipe is loaded in pyramidal form.

117-A. GONDOLA CARS.— Galvanized corrugated sheet-iron culvert pipe of all sizes, for size and number of stakes to be used, see Rules 12 and 112. When mixed sizes are loaded on the same car, the small pipe, when possible, should be placed inside the larger size. In loading galvanized corrugated sheet-iron pipe Rule 9 must be complied with.

MINING CARS AND SIMILAR VEHICLES.

117-C. Mining cars and similar vehicles should be loaded and substantially braced and wired according to Figs. 81, 82, 83, 84 or 85.

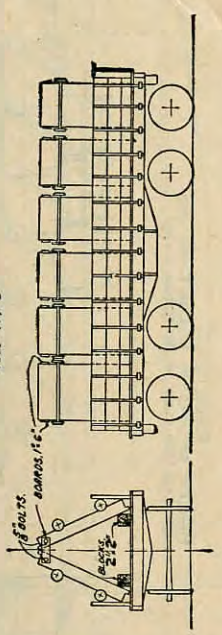


FIG. 81.
MANNER OF LOADING MINING CARS AND SIMILAR VEHICLES IN GONDOLA CARS.
RULE 117-C

FIG. 82.

RULE 117-C

MANNER OF LOADING MINING CARS AND SIMILAR VEHICLES IN GONDOLA CARS.

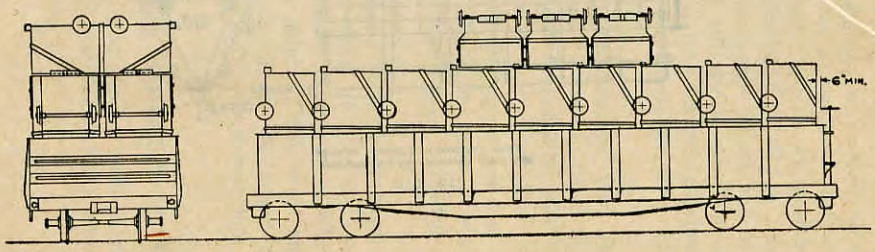
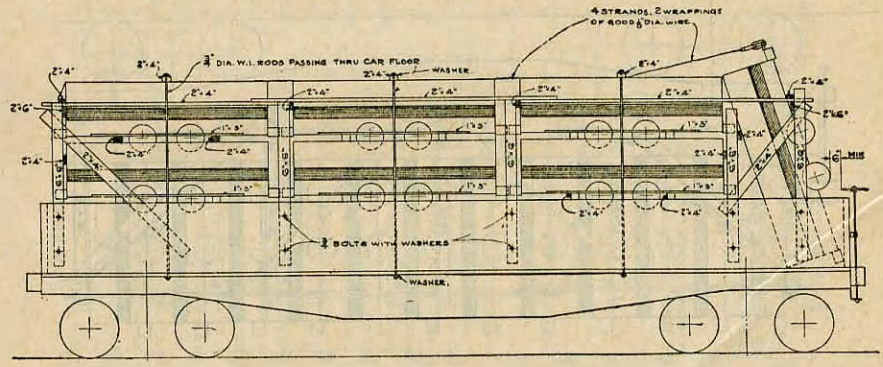


FIG. 83.

RULE 117-C

MANNER OF LOADING MINING CARS IN GONDOLA CARS WITH SIDES LESS THAN 44" IN HEIGHT.

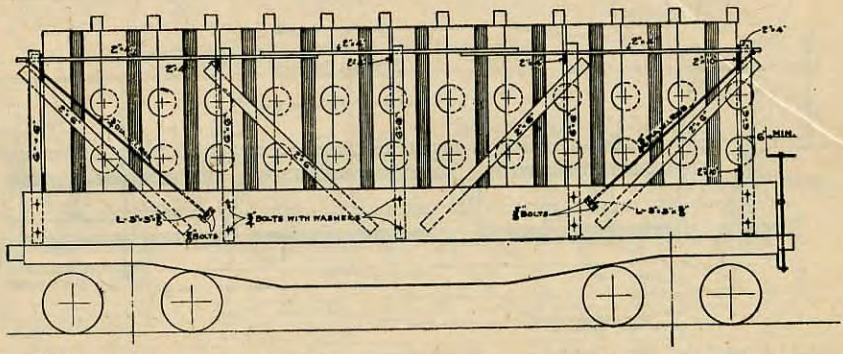


NOTE:-
ALL TIMBERS USED TO SUPPORT LOAD MUST BE HARDWOOD.
SIZES GIVEN ARE MINIMUM.

FIG. 84.

RULE 117-C.

MANNER OF LOADING MINING CARS IN GONDOLA CARS WITH SIDES LESS THAN 44" IN HEIGHT.



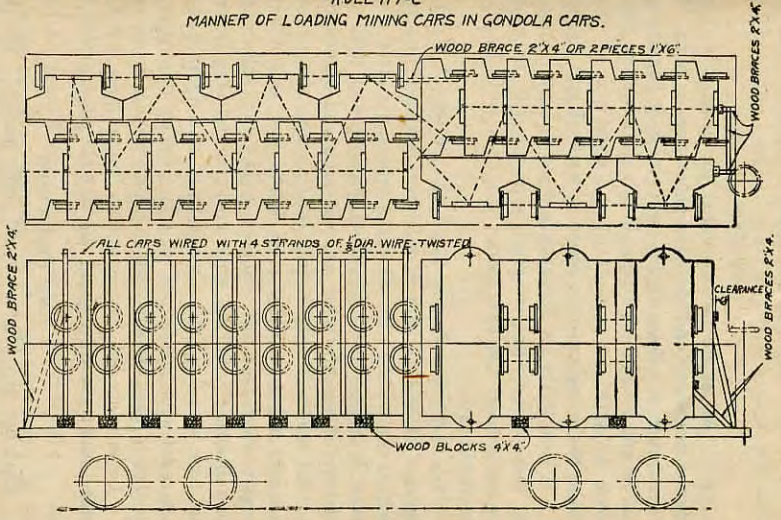
NOTE:-
ALL TIMBERS USED TO SUPPORT LOAD
MUST BE HARDWOOD.
SIZES GIVEN ARE MINIMUM.

FIG. 85.

FIG. 61-E.

RULE 117-C

MANNER OF LOADING MINING CARS IN GONDOLA CARS.



RULES GOVERNING LOADING OF STONE AND BRICK ON OPEN CARS.

General.

118. All stone not provided for should be secured by the necessary end and side protection or both. In all cases when the floor of the car is in such condition that stone not loaded on strips, brush or straw is liable to rock or shift on account of the condition of the car floor, the stone must be securely wedged and cleated.

Where strips for separating stone to keep lading clear of the car floor are referred to in this rule they should be soft wood not less than 1½ inches wide by ¾ inch in thickness.

Standard boards should consist of sound, hardwood lumber at least 1 inch in thickness and not less than 6 inches in width. In all cases where required, boards must be nailed to the inside of the stakes or braces with at least three ten-penny nails at each end of board.

All stakes, wedges and braces must be of sound, hardwood lumber, free from knots that will materially impair their strength. Stakes must be of sufficient size to substantially fill the stake pockets, and may be sawed, split or round. Stakes must be at least 3 inches wide (parallel with the side of car) by 4 inches thick (at right angles to car) or saplings at least 4 inches in diameter.

Unless special arrangements have been made, no stone must extend beyond the outside edge of car floor.

End Protection.

Cars not provided with end stake pockets; the necessary end protection must be secured by toe-nailing stakes against the inside edge of a hardwood strip not less than 3 by 4 inches in section (or two 1½ by 4 inches in section, securely nailed to the floor of the car, one on top of the other), placed crosswise of the car and inside of the end sills. The stakes should extend at least 4 inches above the load and must be wired back to the side stakes in the first or second pocket.

118-A. Small stone, small rip-rap, spalls, rubble, one-man stone, paving blocks, brick, tiling, fireproofing, mill cinder or slag made in cakes, and similar material that can be handled by one or two men, should be loaded in gondola cars. This material may be loaded over drop doors, not boarded over, provided the doors and door mechanism are in good condition.

When the lading consists of small stone, each of which weighs 100 pounds or over, it may be loaded in low-side gondolas or flat cars. When loaded in low-side gondolas, standard stakes and boards must be applied opposite any pieces in the two outside layers that extend above the car sides more than one-half the height of the stone. The end of the side boards must extend at least 12 inches beyond the end of the stone. The stone inside of the two outside pieces may, provided they rest on the car floor, extend above the top of the outside stone a distance not exceeding the height of the outside stone. When loaded on flat cars, standard end staking and boarding should be applied, and the sides should be protected by standard stakes and boards opposite the stone. End and side protection should be applied as specified in Rule 119-A.

119. Flagging, slabs and stone sawed on two sides should be loaded on either gondola or flat cars. The first layer of stone resting on the car floor should be placed on straw, brush or strips of wood of sufficient thickness to insure lading being kept clear of the car floor. Strips when used should be placed crosswise or

lengthwise on the car floor, depending upon the class and dimensions of stone, but in no case is it good practice to use more than two bearing strips per length of stone.

Flagging and stone sawed on two sides should, according to the best practice, be loaded flatwise on each other without the use of any parting material.

Stone sawed on two sides, slabs and flagging, loaded in tiers each of which contains at least 20 square feet of bearing surface resting on car floor, should be protected at the ends by two standard end stakes extending to the height of stone. A standard board should also be securely nailed to the inside of the end stakes and extend full width of the stone. When tiers are made up of stone, each of which contains 20 square feet or more bearing surface resting on car floor, having dimensions of the bearing surface on the car floor less than 2 feet. such stone should have standard side protection as specified in Rule 119-A unless such stone is loaded crosswise the car.

119-A. When flagging and stone sawed on two sides, loaded in tiers 32 inches or more in height or made up of stone containing less than 20 square feet each of surface bearing resting on the car floor, two standard stakes should be placed opposite each tier of stone, in addition to the end protection specified in Rule 119. The distance from the end of stone to the inside of stake should not be less than 12 inches, measuring lengthwise of car.

If on account of the location of the stake pockets or for any other reason this distance can not be obtained, the standard boards should be provided opposite the tier of stone to prevent any possibility of the stone becoming insecure. The boards should be securely nailed to the inside of the stakes.

For any tier built up of stone sawed on two sides or flagging 32 inches or more in height, the side stakes opposite such tier should be securely wired together with two wrappings equal to four strands of good ⅛-inch diameter wire or two 1 by 4 inch boards (one on either side of stake) fastened with at least three ten-penny nails, and the stakes must extend at least 4 inches above the top of stone.

119-B. Small resawed and small planed stone should always be loaded lengthwise of car when practicable, and it should have at least two standard stakes opposite each tier. The distance from the end of the stone to the inside of the stake should be not less than 12 inches measured lengthwise of car. If on account of the location of the stake pockets or for any other reason this distance can not be obtained, standard boards should be provided opposite the tier of stone to prevent any possibility of the stone becoming insecure. Outside tiers of small resawed stone should be placed within at least 3 inches of the side protection, preferably closer.

Large resawed and large planed stone (each of which contains 20 square feet of bearing surface or more resting on the car floor), piled in tiers, should be loaded the same as stone sawed on two sides.

For all resawed and planed stone, both large and small, end protection should be provided as specified in Rule 119 governing the loading of flagging and stone sawed on two sides. In addition, care should be used to see that boards are placed and spaced to prevent the end pieces of stone against shifting.

All planed building stone should, in addition to the end and side protection, be securely wedged, cleated or braced to prevent the stone from shifting.

119-C (CURBING). Curbing loaded lengthwise on flat cars should have two standard stakes opposite each outside piece. The distance from the end of the stone to the inside of stakes should be not less than 12 inches measured lengthwise of car. Otherwise the standard board must be securely nailed to the inside of the stake. Stakes should extend at least two-thirds of the height of the outside stone.

Standard end protection as specified in Rule 119 should be provided, or the stone may be protected by strips approximately 3 by 4 inches (or two strips 1½ by 4 inches securely nailed to the floor of the car, one on top of the other), inside the end sill.

Stone not having a full one-inch vertical bearing its full width against the strip, an additional thickness to get the required bearing, must be secured opposite such stone.

When split or sawed curbing is loaded crosswise of car (split curbing being placed on edge and sawed curbing laid flat in tiers), the end protection as specified in Rule 119 should be provided. When rough-quarried curbing is loaded on edge crosswise of car, in addition to the end protection referred to in Rule 119, strips at least 2 by 2 inches (or two strips 1 by 2 inches securely nailed to the car floor, one on top of the other) should be nailed lengthwise of the car and close to the end of the stone.

If rough-quarry curbing is loaded flatwise in tiers it should be protected at the sides as specified in Rule 119-A.

119-D (DRESSED STONE). On account of the various sizes and shapes of dressed stone, no specific rules can be made governing its loading. Such stone, however, may be loaded on flat, low or high side gondolas or in box cars, depending upon the size of the stones and facilities for unloading at destination. When loaded on flat cars, standard end and side protection must be applied as specified in Rule 119-A.

When practicable, dressed stone should be separated by strips of soft wood or packed in excelsior, stone dust or other suitable material. It should always be securely cleated or blocked to prevent shifting. In all cases dressed stone should be kept clear of the car floor, being loaded on suitable strips, straw or brush.

120. Large block stone, bridge stone, shoddy, breakwater or other large stone containing as much as 30 cubic feet and having a regular surface of at least 8 square feet to rest on car floor, but no dimension of such bearing surface being less than 1 foot 6 inches, should be protected at the ends with standard end stakes extending at least one-half the height of the stone. In no case must the height of the stone be more than one and one-half times the smallest dimension resting on the car floor. The distance from the end of the stone to the inside edge of the stake must be not less than 6 inches measured across the car; otherwise standard board should be securely nailed to the inside of the stakes. When single large blocks as much as 6 feet in length are loaded crosswise of the car, the end protection should be two standard stakes extending at least one-half the height of the stone.

Mill block containing as much as 100 cubic feet, resting on channel or scabbled surface not less than 25 square feet, or proportional for increased sizes, must be so loaded that the weight of total lading will be uniformly distributed over the floor of the car, resting on

a layer of sand, cinders or crushed stone, covering the entire bearing surface of the stone.

Gondola cars are preferable for such shipments, but if flat cars are used, the lading must be placed at least eighteen (18) inches back of end of car. Each block of stone loaded lengthwise, crosswise or obliquely must be protected against creeping by side and end cleats, securely nailed to floor of car with forty-penny nails. (When two blocks of stone are loaded parallel and close to each other, or wedged apart, they will be considered as one stone as to cleating.)

If stone is placed lengthwise of car and is four (4) inches or closer to side of car, two (2) standard side stakes six (6) inches in height must be placed opposite such stone in lieu of cleats, on that side of stone. Stone must not be loaded obliquely when it is possible to load it lengthwise or crosswise of car.

Cleats must consist of not less than 2 by 4 inch sound, straight-grained lumber, and extend at least three-quarters of length or width of stone.

If the 2-inch cleat does not have a full 1-inch vertical bearing for its full length against edge of stone, cleats may be built up to the requisite height, retaining the specified width.

Any large block, bridge, shoddy or other large stone having regular surfaces, not covered by the preceding paragraph must, in addition to the specified end protection, be secured at the sides by the standard stakes opposite the stone. The distance from the end of stone to the inside of the stakes must be not less than 12 inches measured lengthwise of car. If on account of the location of the stake pockets or for any other reason this distance can not be obtained, standard boards should be provided opposite the tier of stone to prevent any

possibility of the stone becoming insecure. Boards should be securely nailed to the inside of the stakes.

Large block, bridge, shoddy or other large stone with irregular surfaces, loaded on flat cars, must be securely wedged, stripped or blocked to prevent the stone from rocking. Standard end protection must be provided as specified in the first paragraph of this rule and two stakes must be placed opposite each outside piece of stone. The end of the stone must not be less than 12 inches from the inside edge of the stakes measured lengthwise of car. If on account of the location of stake pockets or for any other reason this distance can not be obtained, standard boards should be provided opposite the blocks or stone to prevent any possibility of the stone becoming insecure. When such stone is loaded in gondola cars it should be securely wedged, stripped or blocked if there is any possibility of the stone rocking. Large block, bridge, shoddy, breakwater or other large stone should not be loaded in gondola cars unless there are derrick facilities for unloading.

120-A. Gondolas with drop or hopper doors not boarded over should have lading cleated and chocked so as to prevent shifting over doors.

120-B. GRINDSTONES.— GONDOLA CARS: Grindstones 4 feet and over in diameter should be loaded as per Fig. 86. The bottom stone of each tier should rest evenly on four heaps of stone turnings or grindings placed upon the floor of the car, keeping the lading at least two inches clear of floor. The successive layers of stones must be separated by two 1 by 2 inch softwood strips placed flat and crosswise of car. *Hardwood stakes to fill the holes* in the grindstones must be placed through each tier extending from floor of car to six inches above top of tier, and all the stakes must be

FIG. 86.

RULE 120-B

MANNER OF LOADING GRINDSTONES IN GONDOLA CARS.

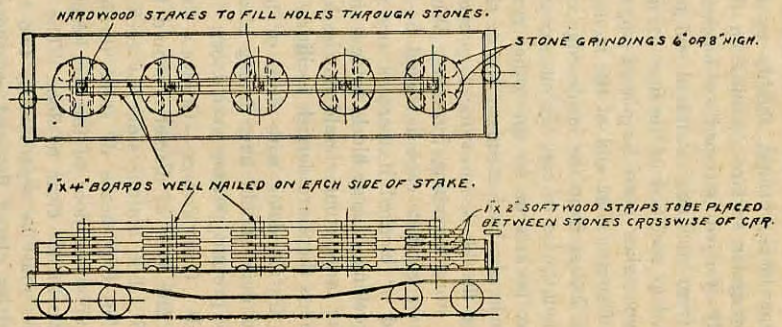
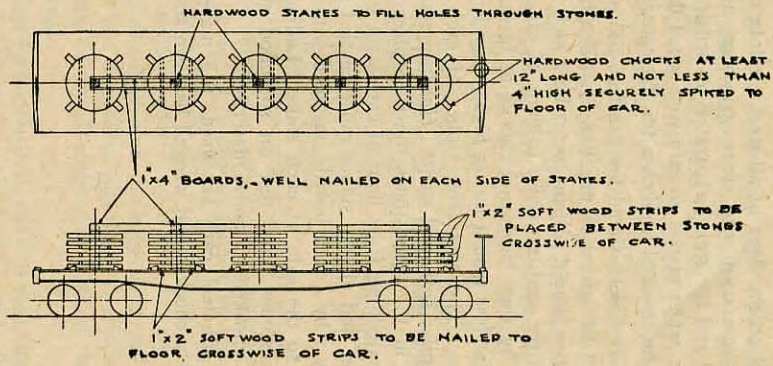


FIG. 87.

RULE 120-B

MANNER OF LOADING GRINDSTONES ON FLAT CARS.



tied together at the top by 1 inch by 4 inch boards, fastened with four ten-penny nails to the side of each stake. When the lading consists of single grindstones, placed on the floor of all-steel gondola cars, each stone must rest upon the stone grindings as provided for above and the stones separated by brush placed between them; when placed on cars with wood floors each stone must be chocked as shown for flat cars, Fig. 87.

FLAT CARS: Grindstones 4 feet and over in diameter should be loaded as per Fig. 87. The bottom stone of each tier should rest on two 1 by 2 inch softwood strips nailed flat and crosswise to floor of car, and be held in place by four hardwood chocks at least 12 inches long and not less than 4 inches high, securely spiked to floor of car. The successive stones of each tier must rest on similar softwood strips. *Hardwood stakes to fill the holes* in the grindstones must be placed through each tier, extending from floor of car to six inches above top of tier, and all the stakes must be tied together at the top by 1 by 4 inch boards, fastened with four ten-penny nails to the side of each stake. Lading consisting of single stones must rest on softwood strips and each stone chocked as above described.

If all-steel cars are used, the material should be securely chocked and wedged between stakes.

RULES GOVERNING THE LOADING OF CYLINDRICAL BOILER SHELLS AND TANKS.

121. Lading of this description eight (8) feet or less in diameter, when loaded on single flat or gondola cars, should be substantially chocked with side blocking in height equal to one-seventh the diameter of the shell, providing that blocking of more than ten (10) inches in height will not be required. End blocking to be not less than four (4) inches in height. See Fig. 88.

Lading over eight (8) feet in diameter, when loaded on single flat or gondola cars with sides less than 30 inches in height, must be substantially chocked with side blocking not less than ten (10) inches in height and backed up by the use of stakes in the stake pockets, and in addition to this must be secured with two (2) bands of not less than three-quarter (¾) inch round iron or flat bands of equal section. End blocking to be not less than six (6) inches in height, bolted to car floor and securely cleated. See Fig. 89.

When loaded in gondola cars with sides thirty (30) inches or over in height the bands will be unnecessary, but precaution in regard to blocking must be taken as specified for lading eight (8) feet in diameter.

When such lading is placed upon two (2) or more cars as a tandem shipment it should be secured with two (2) bands of not less than seven-eighths (⅞) inch round iron or flat bands of equal section, in addition to the prescribed blocking.

Steel tanks, lined or unlined, in sections weighing not over 2,500 pounds per section, eight (8) feet or less in diameter, when loaded on single flat or gondola cars, must be substantially chocked on each side with blocks

FIG. 88.

RULE 121

BOILER SHELLS & TANKS 8FT OR LESS IN DIAMETER

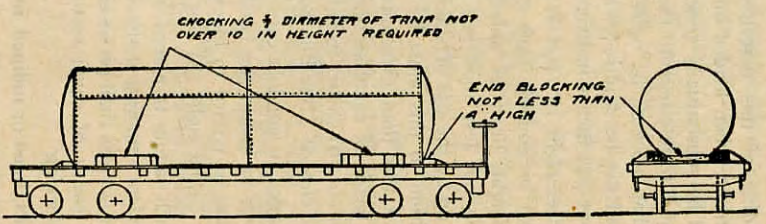
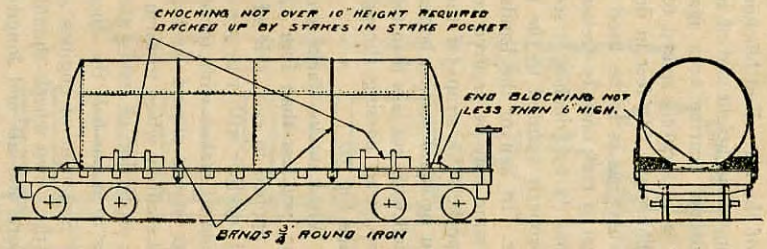


FIG. 89.

RULE 121.

BOILER SHELLS & TANKS OVER 8FT. IN DIAMETER.



not less than six (6) inches in height and of sufficient length and width so that they may be securely spiked to the floor of the car. End blocking to be not less than four (4) inches in height and of sufficient length to provide for proper bearing area against head of tank or shell and to be securely spiked to the floor of the car. If more than eight (8) feet in diameter, the same side and end chocking is to be used and in addition each tank or part of tank must be secured with two (2) bands not less than ⅛ by 2 inches in section passing over the top and properly secured to the floor or stake pockets of the car. In lieu of the bands over the top of the shell the same may be secured to the floor of the car or stake pockets by straps of three-quarter (¾) inch round iron or equal section bolted to the flange of the tank or shell with not less than two (2) bolts, the lower end of the strap passing through the floor or stake pocket. See Fig. 90.

121-A. When smoke stacks are shipped on same car with boiler, not less than four (4) 4 by 4 inch stakes should be applied to each side of car, and each pair of stakes tied together with 1 by 5 inch cross braces, nailed to each side of stakes with three (3) ten-penny nails. The smoke stacks should be loaded on top of cross braces and securely wired to them with ⅛-inch diameter wire. The projection of stakes above cross brace should not be less than one-half the diameter of smoke stack.

121-B. Shipment of engines and similar machinery loaded on their own wheels should have wheels securely chocked fore and aft and longitudinal sills placed on the outside of wheels and securely fastened to floor of car. Struts should be used to prevent the heavy parts of the engine and similar machinery shifting endwise. One end of the strut should be placed against some

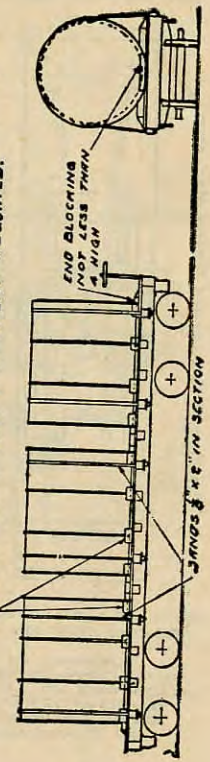


Fig. 90.
RULE 121.

SECTIONS OF BOILERS, TANKS OR SHELLS OVER 8 FEET IN DIAMETER WEIGHING LESS THAN 2500 LBS. PER SECTION.

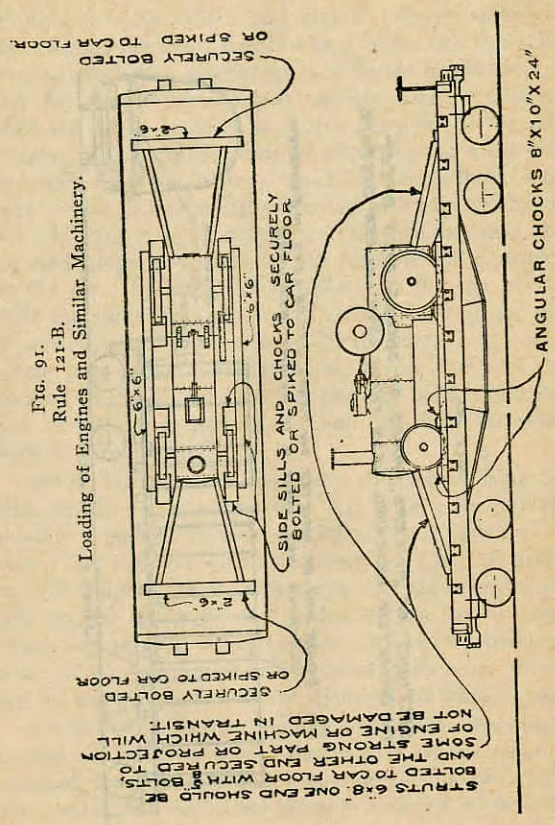


Fig. 91.
Rule 121-B.
Loading of Engines and Similar Machinery.

Fig. 92.

Rule-121-B

Manner of Loading Engines and Similar Machinery.

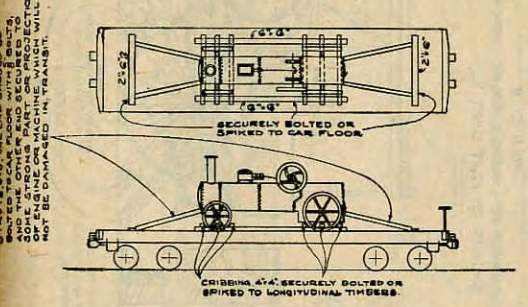


FIG. 93.
RULE 121-B.
MANNER OF LOADING GASOLINE TRACTOR ENGINES ON FLAT CARS

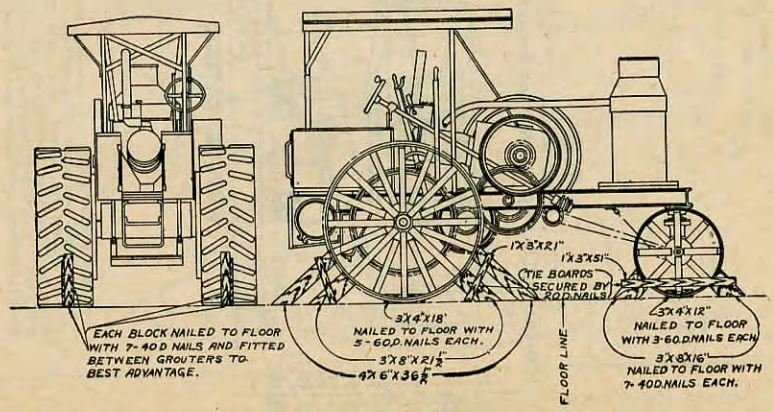
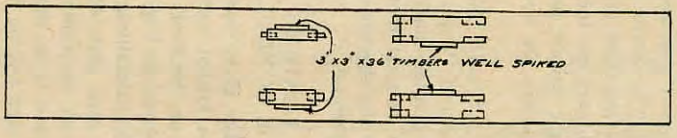
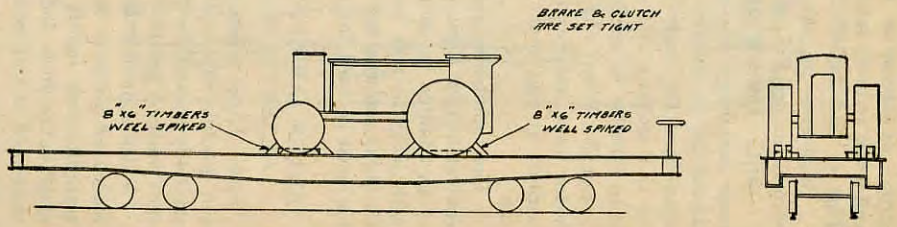


FIG. 94.
RULE 121-B
MANNER OF LOADING GASOLINE TRACTOR ENGINES ON FLAT CARS





strong projection on engine or machinery — the other end being securely fastened to floor of car. See General Figs. 91 and 92.

Shipments of gasoline tractor engines should be secured as per Fig. 93 or 94.

121-C. Derrick cars, steam shovels and similar pivoted machinery, when shipped on their own wheels or loaded on cars, either with or without boom in place, must have the rotating portion substantially anchored by two anchors at the front and two anchors at the rear (similar to wrecking cranes) to prevent swinging in transit. When such machinery has the boom in place, boom must be placed in the lowest position and the anchors at that end must secure the boom to carrying car.

The minimum section of each anchor must be equivalent to a wrought iron rod 1¼ in. in diameter.

In addition to anchors, pivoted machinery equipped with jacks to take care of vertical motion must have the jacks screwed tight; in the absence of jacks, blocking must be used for this purpose.

RULES GOVERNING LOADING OF PLATE GLASS ON FLAT OR GONDOLA CARS.

122. Large pieces of plate glass carried on flat cars and gondola cars should be loaded vertically and substantially secured by cleats on the floor. Side braces at ends must be provided as shown in Fig. 95.

When a number of boxes containing plate glass are loaded on gondola or flat cars, they should be loaded vertically, one tightly against the other, with one end of all boxes flush, and blocked along the side of outside boxes and at both ends of each box on floor of car with not less than two (2) by four (4) in. blocks, ten (10)

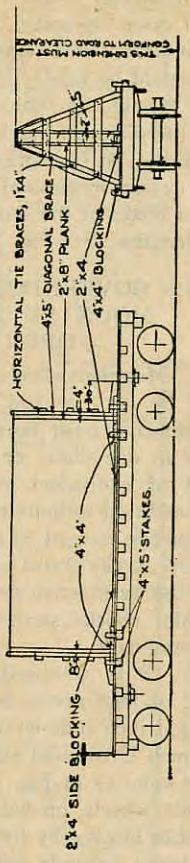


Fig. 95.
RULE 122.

LADING OF PLATE GLASS ON FLAT CARS.

in. long. Diagonal braces of not less than two (2) by six (6) in., securely nailed at top of outside boxes, and braced and cleated at bottom to sides of floor, to prevent shifting, should be used. Three horizontal ties not less than one (1) in. by four (4) in. should be securely nailed to the diagonal braces and ends of boxes where they are flush. At opposite end diagonal braces not less than two (2) in. by six (6) in. should be used to brace each set of boxes of the same lengths, or each box if of different lengths. See Fig. 96.

RULES GOVERNING THE LOADING OF MOUNTED WHEELS ON OPEN CARS.

122-A. Mounted wheels may be loaded on flat cars as shown by Figs. 97 and 98. If Fig. 97 is followed the end blocking must be not less than 8 by 8 inches in section in one piece, or made up of two pieces of hardwood of equivalent section and secured by end stakes in addition to bolts through floor, or by separate blocking pieces secured to floor and end sill. IN ADDITION TO THIS, EVERY OTHER OUTSIDE WHEEL, ON BOTH SIDES OF CAR, MUST BE BLOCKED BY four (4) inch by eight (8) inch angular chocks securely spiked to the floor with twenty-penny nails.

If Fig. 98 is followed, three pairs of wheels at either end of load are to be tied together, using three-quarter (¾) inch rods with clamp plates or three-quarter (¾) inch U rod and plate as shown. End blocking to be the same as in Fig. 97. In addition to this, the two outside wheels, on both sides of car, in center of load, must be blocked by four (4) inch by eight (8) inch angular chocks, securely spiked to the floor with twenty-penny nails.

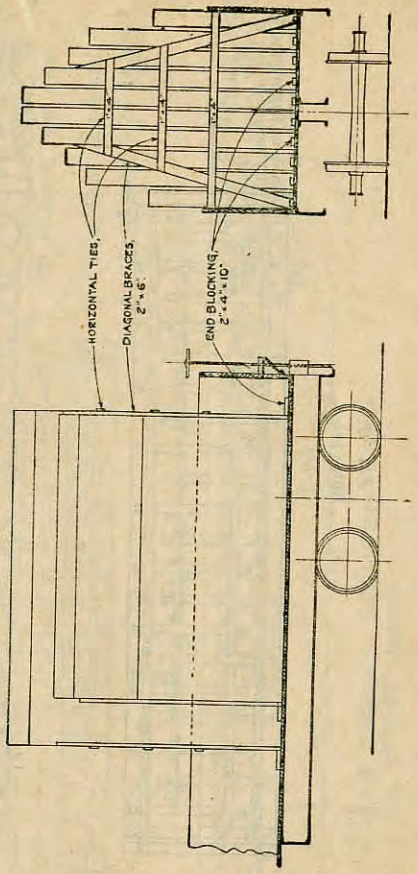


FIG. 96.
RULE 122
MANNER OF LOADING PLATE GLASS ON FLAT OR GONDOLA CARS.

FIG. 97.
Rule 122-A.

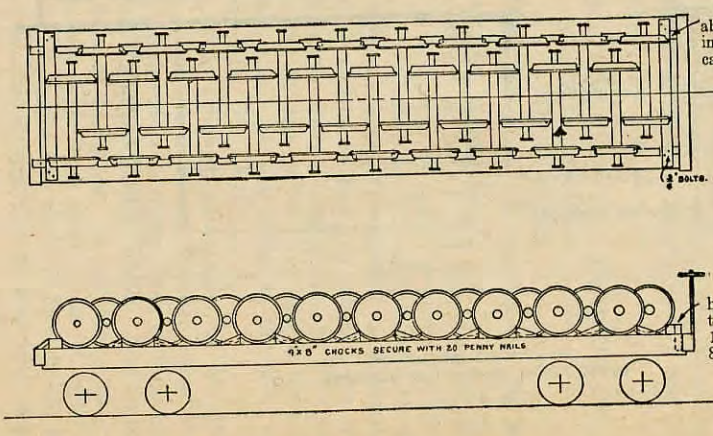
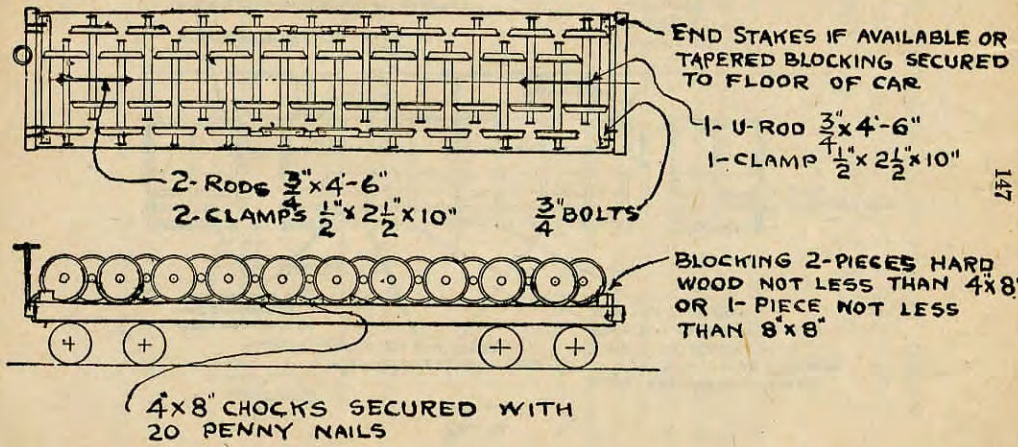


FIG. 98.

RULE: 122-A.



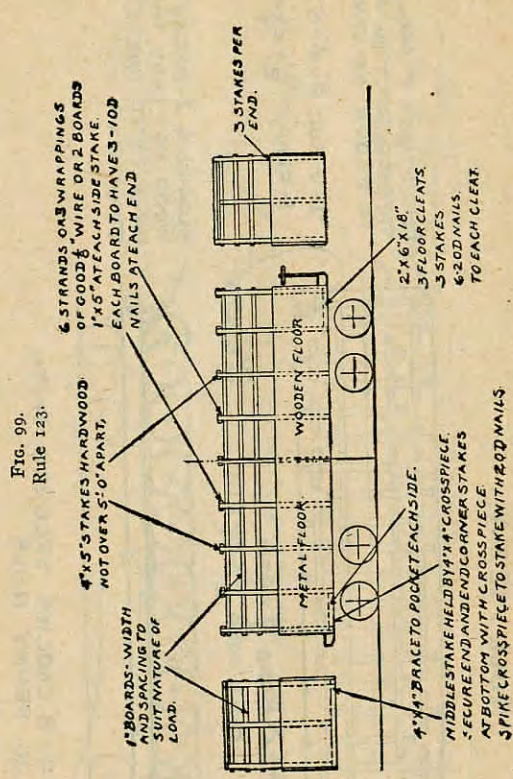


FIG. 99.
Rule 123.

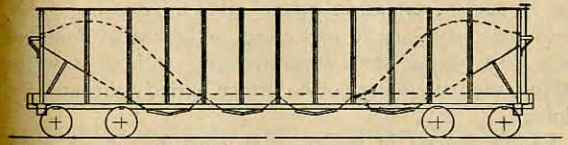
RULES GOVERNING LOADING OF SCRAP, JUNK AND SIMILAR MATERIALS ON OPEN CARS WITH OR WITHOUT RACKS.

123. When open cars are loaded with material such as scrap, junk, etc., the load must not extend above the sides or racks, if the latter are provided, unless top of load is securely tied down with sufficient number of strands of good ⅛-inch diameter wire, to prevent lading from rolling off. If racks are used, the spaces between the slats should be sufficiently sealed, to prevent loss of material or ends of pieces working through. See Fig. 99.

FIG. 100.

Rule 123-A.

Manner of Loading Iron Ore, Limestone and Similar Material.



123-A. Iron ore, limestone and similar heavy material, transported in open cars, should be loaded as shown in Fig. 100.

RULES GOVERNING LOADING MATERIAL IN BOX AND STOCK CARS.

NOTE.— The inspector or agent at the loading point must see that the rules for loading material in closed cars are strictly enforced. Where opportunity is provided, the lading should be inspected in transit.

124. Lading must be secured in closed cars so that it will not come in contact with side doors or roll or shift in transit, and must be so placed in car that there will not be more weight on one side of car than on the other.

Lading of a character requiring protection to prevent it falling or rolling out at doorway or coming in contact with door while in transit must have the prescribed stripping across the door opening.

Door strips must be nailed to the inside of door posts (never on the outside) and must not be less than one (1) inch thick by five (5) inches wide, straight-grained sound lumber or their equivalent; or slabwood not less than one and one-half (1½) inches thick at center; placed sufficiently close to floor of car and to each other to prevent the lading from falling or rolling out of car or coming in contact with the door.

When necessary to nail cleats or braces to lining of box cars having steel superstructure without exterior siding, the nails must not be driven entirely through the lining.

Lading loaded in vehicle cars with end doors must be securely protected against end shifting and loaded in such a manner that the lading will not come in contact with end or side doors.

124-A. Brick 15 inches or less in length loaded interlocked at doorway do not require door protection if

built up as per Fig. 101 and packed tight to prevent motion between bricks. Brick of any length loaded lengthwise at doorway must have door protection as per Fig. 102. Such brick should also be packed tight to prevent motion between each other.

125. Barrels should be loaded in accordance with Figs. 103 and 103-A. If the barrels do not fully fill the space they should be chocked to prevent sliding and rolling.

126. Barrel staves, fence posts, wooden billets, lath, tan bark and similar short wood should be loaded in accordance with Figs. 104 or 105. If the pieces are tapered, they must be loaded with tops and butts alternating. The material must be loaded longitudinally with car, except at door openings, where it must be placed crosswise. If loaded in accordance with Fig. 104, the doorway must be protected with strips extending across door opening, securely nailed on the inside of door posts. For the size of strips and manner of stripping doorways see Rule 124.

If loaded in accordance with Fig. 105, the outer ends of staves or similar short material, whatever it may be, but of a length permitting two piles to be loaded end to end in doorway and still be at least 10 inches inside of door line, must rest on pieces not less than 4 inches thick and laid lengthwise of door openings, in order to make the pile incline toward center of car. This method makes the stripping of door opening unnecessary.

127. Hewed ties 8 feet or more in length, or sawed ties of lengths 8 to 12 feet, or similar material which does not conform to Rule 126, may be loaded longitudinally in four tiers, as per Fig. 106, in which case the ends of the tiers next to the end of car and end of ties

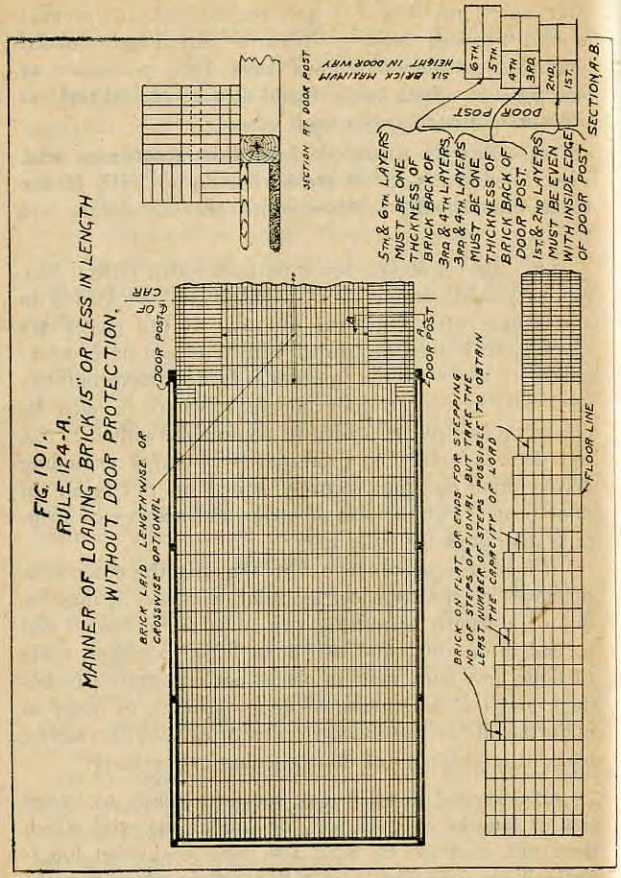


FIG. 102.
RULE 124-A.

MANNER OF LOADING BRICK WHEN DOOR PROTECTION IS REQUIRED.

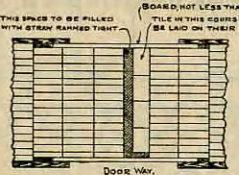
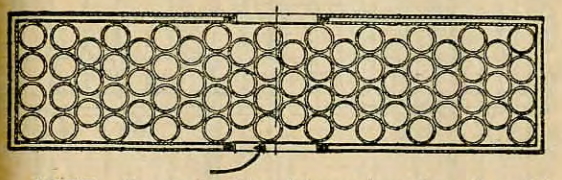
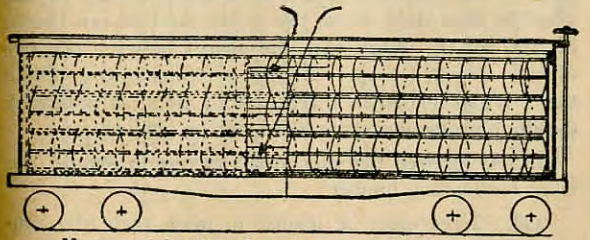


FIG. 103.
Rule 125.



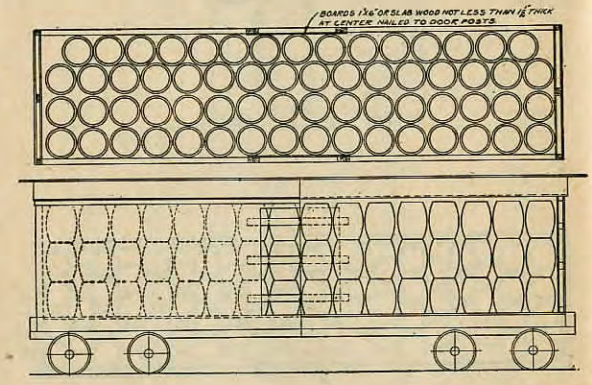
NOTE.—Boards 1 x 6″ or slab wood not less than 1½″ thick at center nailed to door posts.



Manner of Loading Barrels in Box or Stock Cars.

FIG. 103-A.
Rule 125.

Manner of Loading Barrels in Box or Stock Cars.

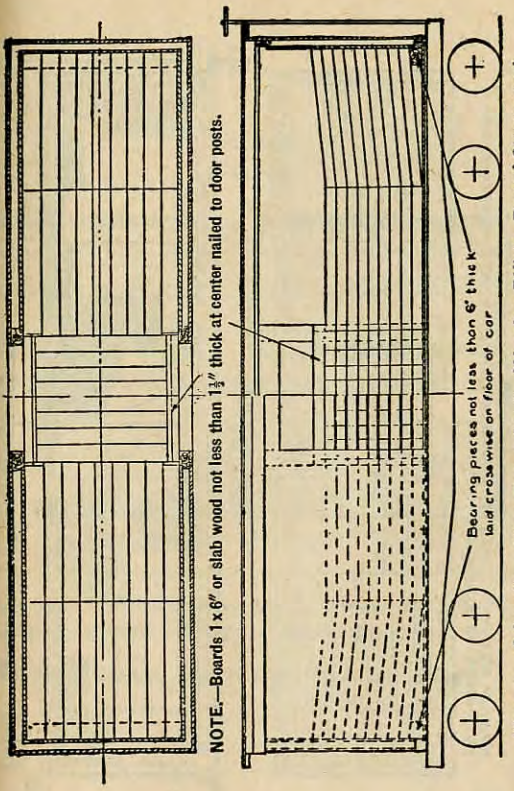


projecting into the doorway must rest on bearing-pieces not less than 6 inches thick laid crosswise on floor of car. If the length of car is such that ties can not be piled in four tiers, three tiers may be used, as shown in Fig. 107, in which case the spaces between the ties must be blocked to prevent any shifting of the middle tier. When loaded in three or four tiers, as indicated, the door protection strips need not be applied.

127-A. Sawed ties more than 12 feet in length (see rules for loading lumber).

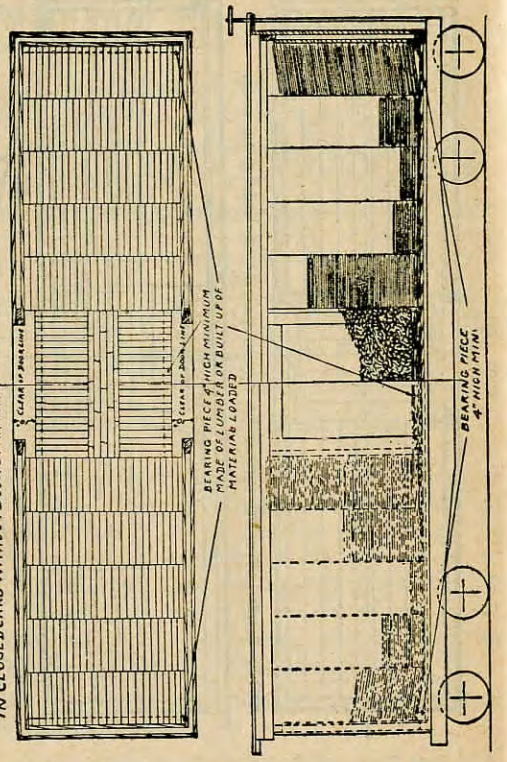
128. Tires must be loaded in piles, each pile consisting of tires laid on top of each other and inclined tires tipped against those lying flat, keying them in

FIG. 104.
Rule 126.



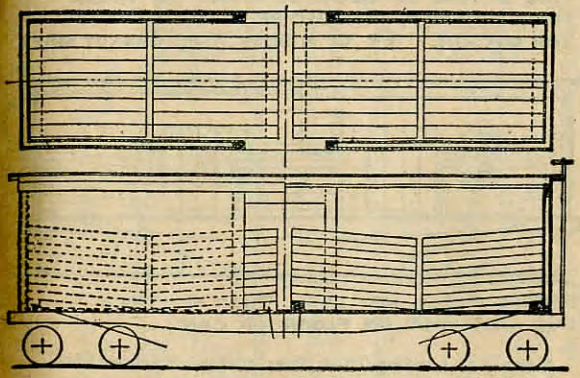
Manner of Loading Ties, Fence Posts, Wooden Billets, Barrel Staves and Similar Short Wood in Closed Cars.

Fig. 105.
Rule 126.



MANNER OF LOADING STAVES-FENCE POSTS-LATH-TAN BARK AND SIMILAR MATERIAL IN CLOSED CARS WITHOUT DOOR STRIPPING

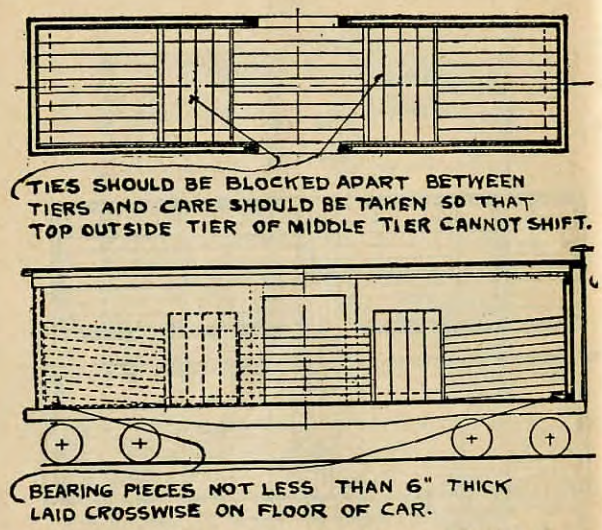
Fig. 106.
Rule 127.



BEARING PIECES NOT LESS THAN 6" THICK LAID CROSSWISE ON FLOOR OF CAR.

Manner of Loading Four Piles of Ties in Closed Cars

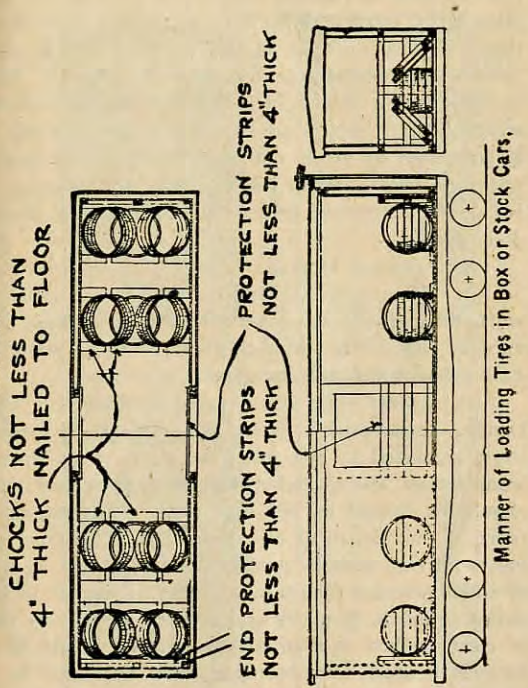
FIG. 107.
Rule 127.



Manner of Loading Three Piles of Ties in Closed Cars.

place as per Fig. 108. The bottom tire of each pile must be chocked to prevent sliding. The ends of car must be protected by boards or slab wood not less than 4 inches thick, extending from side to side of car and spaced not less than 4 inches from end sheathing by vertical pieces, to which the protection strips must be secured. The door openings must be protected by means of strips not less than 4 inches thick nailed to inside of door posts.

FIG. 108.
Rule 128.



Manner of Loading Tires in Box or Stock Cars.

129. Car wheels should be loaded as per Fig. 109. At end of car the wheels should be laid flat, with flange upward; then two rows, one on each side of car, touching side lining and inclining toward center of car, should rest against those lying flat. The space between the two rows must be blocked apart either by wheels placed longitudinally or by means of chocks. Chocks not less than 4 inches thick should be used to block the wheels nearest center of car, and door openings must be protected by strips not less than 3 inches thick for door openings 6 feet or less in width, and 4 inches thick for door openings of greater widths, nailed to inside of door posts.

130. Omitted in 1915.

131. When material loaded in stock cars is liable to work through the space between the slats, these spaces must be sufficiently sealed to prevent loss of material or ends working through the spaces.

132. Unless otherwise covered by governing Classification, sewer pipe in closed cars should be loaded in tiers, separated by not less than ½ in. by 2 in. hardwood strips. The space between the tiers at door opening should be braced as per Fig. 110. When one-half or more of one length of pipe extends beyond door opening, such tier must be protected on each side by means of sound wood, 2 inches by 4 inches in section, or slabs, nailed to inside of plates and secured at floor by means of cleats spiked to floor of car. If full length of pipe extends beyond door openings, such tier must be protected by two pieces of 2 by 4 inch sound wood or slabs on each side, secured as specified above for single piece on each side.

132-A. DRAIN TILE LOADED IN CLOSED CARS.— Unless otherwise covered by governing Classification, tile 8

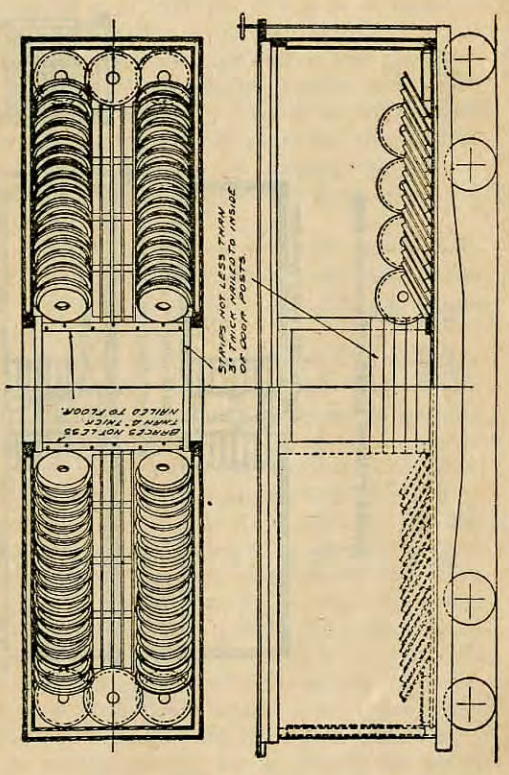


Fig. 109.
Rule 129.

MANNER OF LOADING WHEELS IN CLOSED CARS

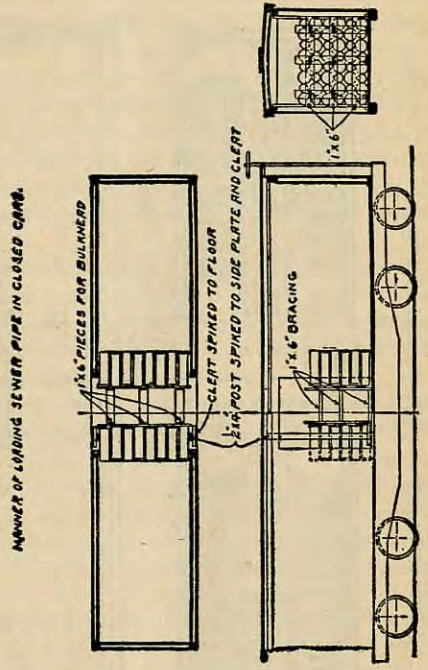


Fig. 110.
Rule 132.

in. in diameter and under should be loaded in tiers, as per Fig. 111. (See Rule 124 for required door protection.) Tile 10 in. to 28 in., inclusive, in diameter should be loaded as per Fig. 112, and 30 in. in diameter and over should be loaded as per Fig. 113.

133. If box cars are used for loading heavy machinery, such as lathes, planers, boring machines, etc., each machine should be blocked by securely nailing to floor of car 2 by 4 inch hardwood strips fore and aft. Machinery resting on legs should be securely braced and propped at ends in addition to the floor strips, to prevent breakage by shifting.

133-A. To protect the ends of cars loaded with greased shaftings, boards two and one-half (2½) inches thick, full width of car and to height of lading, should be securely nailed to end of car.

134. Place automobile in car parallel with car sides. See that front wheels are in line with back wheels. Set brakes. The lower third of tires should be wrapped with at least two thicknesses of good burlap to prevent chafing. Secure each wheel with bands of good strong material (canvas preferred) fastened with 2 by 4 by 12 inch sound wood blocks, placed on each side parallel with wheel, and securely nailed to car floor to prevent bands from pulling loose. Each wheel should be chocked fore and aft with angular chocking one-third the height and two inches wider than wheel. The chocking of each wheel should be tied together with a board on each side of wheel, securely nailed to the chocks. To preserve alignment of the front wheels, small ropes tightly drawn should be fastened from the top of one wheel to the bottom of the other. Burlap should be placed around wheels under rope to protect paint. When shipped without tires, no part of the wheel except cen-

FIG. 111.

RULE 132-A

MANNER OF LOADING

DRAIN TILE, 8" IN DIAMETER AND UNDER.

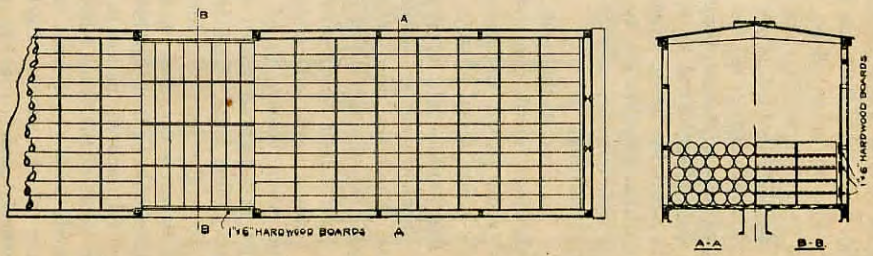
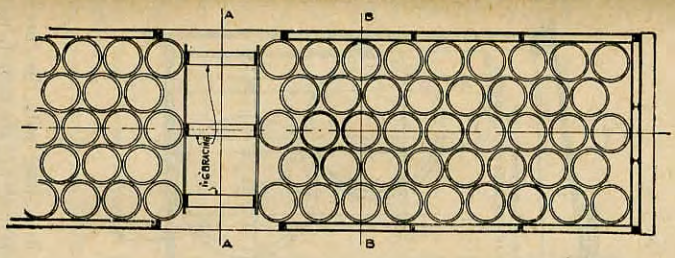


FIG. 112.

RULE 132-A.

MANNER OF LOADING DRAIN TILE 10" TO 28" IN DIAMETER.



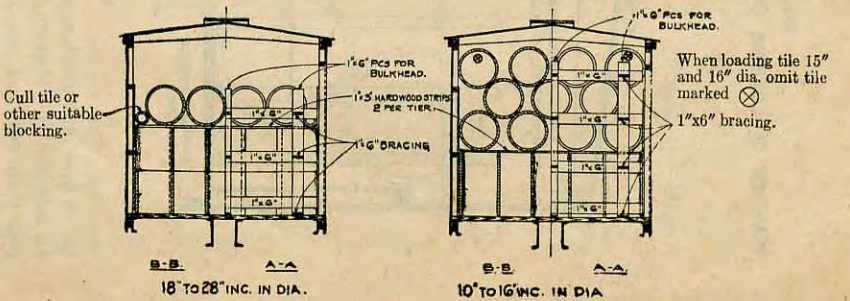
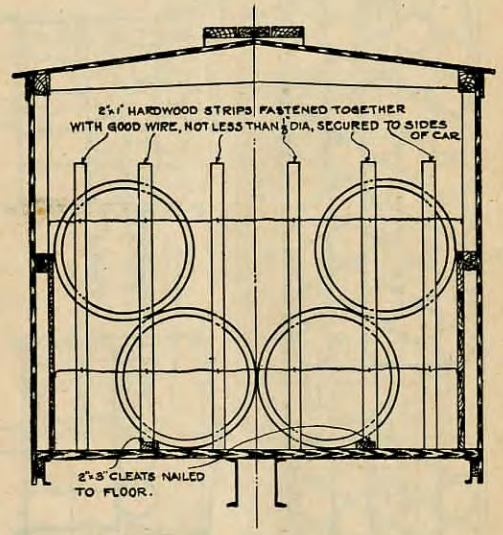


FIG. 113.

RULE 132-A.

MANNER OF LOADING DRAIN TILE 30" IN DIA. AND OVER.



ter of the rim should come in contact with the chocking. In addition to chocking referred to, an iron band not less than one and one-quarter (1¼) inches wide and not less than 18 gauge in thickness should be passed over top of wheel and securely fastened to chocking.

INDEX