RULES FOR LOADING
LONG MATERIALS.

REVISED MAY 15, 1908
JOINT GENERAL NOTICE

PENNA. R. R. CO. NO. 176-F  PENNA. LINES No. 85

(Superseding Penna. R. R. Co. General Notice 176-E; Penna. Lines General Notice No. 88; Vandalia Railroad Co. and G. R. & I. Ry. Co. General Notices dated October 1st, 1906; and Supplements Nos. 1 and 2.)

EFFECTIVE MAY 15, 1908

RULES GOVERNING
—the—

Loading of Lumber, Logs, Ties, Stone, Slabwood, Bark, Etc., on Open or in Closed Cars; and Loading and Carrying Structural Material, Plates, Girders, Rails, Pipe, Etc., adopted by the Above Lines

M. TRUMP,  A. W. GIBBS,
General Supt. Trans., General Supt. Motive Power,
Penna. R. R. Lines East Penna. R. R. Lines East

R. M. PATTERSON,  M. C. KENNEDY,
Supt. Freight Trans., V. Pres. & General Supt.,
Penna. R. R. Lines East Cumberland Valley Railroad

A. B. STARR,  D. F. CRAWFORD,
General Supt. Freight Trans., General Supt. Motive Power,
Penna. Lines East Penna. Lines West

BENJ. McKEEN,  J. H. P. HUGHART,
General Manager, V. P. & General Manager,
Vandalia Railroad Grand Rapids & Indiana Ry.
RULES FOR LOADING LONG MATERIALS ON OPEN CARS.

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 to be used for shipments of this character must be carefully examined, all defects remedied, and should be properly cambered by drawing up the truss rods.

3. Where maximum weights of lading are not specified, the usual excess of ten per cent will be allowed.

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, 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 $\frac{3}{8}$ inch for loads less than 10 feet high from top of rail, and must not exceed $\frac{1}{4}$ inch for loads 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 wooden car sides which are three (3) inches or more in thickness, or steel cars with sides es-
FIG. 1.

See Rules 4 and 9.

BOARDS 1" x 5" FASTENED WITH 3-10D WIRE NAILS.

STAKES 4" x 5"

LIMITS OF
PROJECTION OF LADING ON SINGLE CAR WHICH
DOES NOT REQUIRE THE USE OF AN IDLER
pecially reinforced with gusset braces, the bearing-pieces must be supported and held in place as per Figs. 32 and 33, Rule No. 81; also Fig. 45, Rule No. 92. If lading is placed on the top of steel car sides or wooden car sides less than three (3) inches thick, the supports and bearing-pieces must be sufficiently strong to transmit the strain to the car floor and provide against shifting, as shown in Figs. 44, 45-A and 45-B, Rule No. 92.

8. No truck of any car will be allowed to carry more load than one-half of the marked capacity of car, plus ten per cent for overload. 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, except when this projection is six (6) feet six (6) inches or more above top of rail and does not overhang end sill more than six (6) inches, as per Fig. 1.

10. An idler must be used to protect the overhanging load on another car when the load projects over end sill at a height less than (6) feet six (6) inches from top of rail, or when the load projects more than six (6) inches at a height of more than six (6) feet six (6) inches from top of rail. 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.

11. The width of overhanging load, placed on single cars, must never exceed the following dimensions:
<table>
<thead>
<tr>
<th>Length of Overhang</th>
<th>Width of Load</th>
<th>Length of Overhang</th>
<th>Width of Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>W</td>
<td>C</td>
<td>W</td>
</tr>
<tr>
<td>9 ft. 0 in.</td>
<td>9 ft. 5 in.</td>
<td>15 ft. 0 in.</td>
<td>8 ft. 7 in.</td>
</tr>
<tr>
<td>10 ft. 6 in.</td>
<td>9 ft. 2½ in.</td>
<td>16 ft. 6 in.</td>
<td>8 ft. 4 in.</td>
</tr>
<tr>
<td>12 ft. 0 in.</td>
<td>9 ft. 0 in.</td>
<td>18 ft. 0 in.</td>
<td>8 ft. 1 in.</td>
</tr>
<tr>
<td>13 ft. 6 in.</td>
<td>8 ft. 9½ in.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The overhang is measured from center of truck to extreme end of overhang.

12. All stakes, clamping-pieces, bearing pieces and braces must be sound straight-grained lumber (hardwood preferred) and free from knots that would materially impair their strength. Hemlock must never be used except for single loads of sawed lumber as provided for in Rule No. 32, Fig. 4. 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. Unless otherwise specified, stakes for flat and gondola cars with sides less than thirty (30) inches high, should be four (4) inches wide by five (5) inches deep, or saplings five (5) inches in diameter at center. For gondola cars with sides thirty (30) inches high or over, stakes must be four (4) inches wide by (4) inches deep, or saplings four (4) inches in diameter at center, tapered at the end to accurately fit, extend through and completely fill the stake pockets.

(a) Stakes may be placed on inside of gondola cars, provided they rest on the car floor and are substantially secured at the bottom ends and at the top of car sides, to prevent shifting. Gondola cars not equipped with stake pockets to suit the required
number and size of stakes should have the stakes placed inside of car side.

(b) 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 depth of stake, is measured at right angles to side of car.

(c) If stakes are of smaller dimensions than stake pockets they must be wedged to completely fill the pockets, and the wedges must be securely nailed to the stakes.

For flat and gondola cars with sides less than 30 inches the recommended stake should be used, but for gondola cars with sides 30 inches or over, stakes 3 inches wide by 4 inches deep may be used as the minimum size for general loading, except for lumber, which is provided for in Rule 34.

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) inches in section, and fastened at each end by not less than three ten -penny wire nails. (Hemlock must never be used, except for single loads of sawed lumber, as per Rule 32 and Fig. 4.) When the specified fastening is by means of wire, the wire used unless otherwise specified, must be equal to six (6) strands or three (3) wrappings of good ⅜-inch diameter wire, and the wire must be secured to prevent it from slipping.

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 be 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.

To prevent overloading, the following regulations must be adhered to. Where reference is made to the capacity of car, it implies marked capacity plus ten per cent.

(a) For loads carried on one bearing-piece per car located near the center of car: On flat cars having only two truss rods the weight of lading must not exceed one-half of the capacity of car. On flat cars having more than two truss rods, and on low-sided gondola cars, the weight of lading must not exceed two-thirds the capacity of car.

(b) For loads carried on one bearing-piece per car located about equal distance from center of car and center of truck. On flat cars not exceeding thirty-four (34) feet in length and having only two truss rods the weight of lading must not exceed two-thirds the capacity of car; on flat cars more than thirty-four (34) feet in length having only two truss rods the weight of lading must not exceed one-half the capacity of car. On flat cars having more than two truss rods, and on low-sided gondola cars, the weight of lading must not exceed three-fourths of the capacity of car.

(c) For loads carried on one bearing-piece per car, 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.)
sides of gondola cars the distance from top of rail to centre of load, measured at bearing pieces, must not exceed nine (9) feet three (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 (\(\frac{3}{4}\)) 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, which require more than two sliding pieces in addition to the bearing pieces, the weight of lading must not exceed one-half of the capacity of car, if lading consists of plates or similar material loaded as per Fig. 43. Structural material of less flexibility must conform to Rules 15a and 15b and should be loaded as per Figs. 41 and 42.

(f) For loads carried on one bearing-piece on steel cars, or cars having steel underframes, the cars should be treated the same as those of wooden construction having more than two truss rods.

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

(h) Cars classes F'M, GR and GRA may carry concentrated loads not exceeding 80,000 pounds for loads on one bearing piece placed over either cross-bearer, or between cross-bearers; or may carry 110,000 pounds for loads equally divided on two bearing pieces placed over the two cross-bearers.

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 of the cars, both carrying cars and idlers. The amount of this clearance must not be less than four (4) inches.

18. A group of cars must have not less than one accessible and operative hand brake for two cars, or two hand brakes for three or five 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 loadings.

22. Where the dimensions of bearing-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. Bearing-pieces, sliding-pieces, chocks, headblocks, etc., must have a width of base
at least equal to their height. These bearing-pieces must be securely fastened to the floor of the car as provided for in Rule No. 72.

23. Bearing-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 distance between bearing-pieces of ladings on two or more cars should be seven-tenths (7:10) of the total length of lading.

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.

<table>
<thead>
<tr>
<th>Distance Between Bearing-pieces</th>
<th>Length of Overhang</th>
<th>Width of Load</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>D</strong></td>
<td><strong>C</strong></td>
<td><strong>W</strong></td>
</tr>
<tr>
<td>35 ft. 0 in.</td>
<td>7 ft. 6 in.</td>
<td>9 ft. 6 in.</td>
</tr>
<tr>
<td>38 ft. 6 in.</td>
<td>8 ft. 3 in.</td>
<td>9 ft. 4 in.</td>
</tr>
<tr>
<td>42 ft. 0 in.</td>
<td>9 ft. 0 in.</td>
<td>9 ft. 1 1/2 in.</td>
</tr>
<tr>
<td>45 ft. 6 in.</td>
<td>9 ft. 9 in.</td>
<td>8 ft. 11 1/2 in.</td>
</tr>
<tr>
<td>49 ft. 0 in.</td>
<td>10 ft. 6 in.</td>
<td>8 ft. 8 1/2 in.</td>
</tr>
<tr>
<td>52 ft. 6 in.</td>
<td>11 ft. 3 in.</td>
<td>8 ft. 5 1/2 in.</td>
</tr>
<tr>
<td>56 ft. 0 in.</td>
<td>12 ft. 0 in.</td>
<td>8 ft. 2 1/2 in.</td>
</tr>
<tr>
<td>59 ft. 6 in.</td>
<td>12 ft. 9 in.</td>
<td>7 ft. 11 1/2 in.</td>
</tr>
<tr>
<td>63 ft. 0 in.</td>
<td>13 ft. 6 in.</td>
<td>7 ft. 7 1/2 in.</td>
</tr>
<tr>
<td>66 ft. 6 in.</td>
<td>14 ft. 3 in.</td>
<td>7 ft. 4 in.</td>
</tr>
<tr>
<td>70 ft. 0 in.</td>
<td>15 ft. 0 in.</td>
<td>7 ft. 0 in.</td>
</tr>
<tr>
<td>73 ft. 6 in.</td>
<td>15 ft. 9 in.</td>
<td>6 ft. 7 1/2 in.</td>
</tr>
<tr>
<td>77 ft. 0 in.</td>
<td>16 ft. 6 in.</td>
<td>6 ft. 3 1/2 in.</td>
</tr>
<tr>
<td>80 ft. 6 in.</td>
<td>17 ft. 3 in.</td>
<td>5 ft. 11 in.</td>
</tr>
<tr>
<td>84 ft. 0 in.</td>
<td>18 ft. 0 in.</td>
<td>5 ft. 6 1/2 in.</td>
</tr>
</tbody>
</table>

---

Downloaded from http://PRR.Railfan.net - Collection of Rob Schoenberg - ©2019 - Commercial reproduction or distribution prohibited
FIG. 2.
See Rule 26
M E T A L SPACING BLOCKS FOR T W I N AND T R I P L E L O A D S.

DETAIL OF BLOCK FOR 5"X5" SHANK.

DETAIL OF BLOCK FOR 5"X7" SHANK

ELEVATION SHOWING APPLICATION OF BLOCK
FIG. 3.
Chaining of Cars When Loaded with Long Material.
Size of Chain to Conform to M. C. B. Recommended Practice.
See Rules 26 and 27.
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 (latter preferred) to completely fill the space between horns of couplers and end sill, and coupler release rod chain disconnected, as shown in Figs. 2 and 3.

27. When cars are used which are not equipped with permanent safety chains, chains 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. 3. 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 and bearing-pieces 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. 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 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. 6 and 7.*

<table>
<thead>
<tr>
<th>Length of Cars</th>
<th>Length of Material</th>
<th>Capacity of Cars 50,000 lbs.</th>
<th>Capacity of Cars 60,000 lbs.</th>
<th>Capacity of Cars 80,000 lbs.</th>
<th>Capacity of Cars 100,000 lbs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 ft.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 ft.</td>
<td>30 ft.</td>
<td>46,000 lbs.</td>
<td>57,000 lbs.</td>
<td>76,000 lbs.</td>
<td></td>
</tr>
<tr>
<td>34 ft.</td>
<td>32 ft.</td>
<td>42,000 lbs.</td>
<td>53,000 lbs.</td>
<td>71,000 lbs.</td>
<td></td>
</tr>
<tr>
<td>36 ft.</td>
<td>34 ft.</td>
<td>39,000 lbs.</td>
<td>49,000 lbs.</td>
<td>65,000 lbs.</td>
<td></td>
</tr>
<tr>
<td>38 ft.</td>
<td>36 ft.</td>
<td>37,000 lbs.</td>
<td>45,000 lbs.</td>
<td>60,000 lbs.</td>
<td></td>
</tr>
<tr>
<td>40 ft.</td>
<td>38 ft.</td>
<td>41,000 lbs.</td>
<td>50,000 lbs.</td>
<td>66,000 lbs.</td>
<td></td>
</tr>
<tr>
<td>42 ft.</td>
<td>40 ft.</td>
<td>38,000 lbs.</td>
<td>47,000 lbs.</td>
<td>61,000 lbs.</td>
<td></td>
</tr>
<tr>
<td>44 ft.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>46 ft.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>48 ft.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50 ft.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>52 ft.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
For Loads as per Fig. 10.

<table>
<thead>
<tr>
<th>Length of Material</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>Marked Capacity of Cars, Pounds</th>
<th>Maximum Aggregate Weight of Load, Pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 ft.</td>
<td>10' 3''</td>
<td>8' 0''</td>
<td>5' 9''</td>
<td>24' 0''</td>
<td>50 000</td>
<td>105 000</td>
</tr>
<tr>
<td>45 ft.</td>
<td>11' 9''</td>
<td>4' 0''</td>
<td>6' 8''</td>
<td>27' 0''</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40 ft.</td>
<td>10' 3''</td>
<td>10' 0''</td>
<td>5' 9''</td>
<td>24' 0''</td>
<td>60 000</td>
<td>120 000</td>
</tr>
<tr>
<td>45 ft.</td>
<td>11' 9''</td>
<td>6' 8''</td>
<td>6' 3''</td>
<td>27' 0''</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50 ft.</td>
<td>10' 0''</td>
<td>12' 0''</td>
<td>5' 0''</td>
<td>35' 0''</td>
<td>80 000</td>
<td>160 000</td>
</tr>
<tr>
<td>55 ft.</td>
<td>12' 0''</td>
<td>2' 0''</td>
<td>8' 0''</td>
<td>35' 0''</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50 ft.</td>
<td>10' 0''</td>
<td>18' 0''</td>
<td>5' 0''</td>
<td>35' 0''</td>
<td>100 000</td>
<td>200 000</td>
</tr>
<tr>
<td>55 ft.</td>
<td>12' 0''</td>
<td>8' 0''</td>
<td>5' 0''</td>
<td>38' 0''</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For Loads as per Fig. 11.

For material less than ninety (90) feet long, load per car should not exceed one-half of the capacity of the two end cars. For longer material, the load per car must conform to paragraph No. 15.
RULES GOVERNING THE LOADING OF LUMBER ON OPEN CARS.

DETAIL INSTRUCTIONS.

Lumber Loaded on Single Cars, as in Fig. 4.

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

33. Lumber of equal widths must either be lapped or have strips not less than \( \frac{3}{8} \) inch thick by 3 inches wide running the full width of load. Strips should be located not more than 30 inches apart vertically; for flat cars from floor of car; for gondola cars first strip should be placed at top of sides and 30 inches apart above these and spaced 6 feet apart longitudinally to act as binders. There should be at least three vertical rows of strips 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 5 inches wide, fastened at each end by not less than three ten-penny nails, or by six strands equal to three wrappings of good wire \( \frac{3}{8} \) inch in diameter. See Fig. 4. The cross boards or wire should clear top of lading by at least 2 inches. If the number of stakes is greater than indicated
FIG. 4.
See Rules 4, 32, 33 and 53.
Also Rule 34 For Number and Minimum Size of Stakes.
in Sections A, B and C, but conforms to Section D of this rule, the wiring may be reduced to four strands equal to two wrappings of \( \frac{1}{8} \)-inch wire. Where dimensions of stakes are given, the first figure represents the width of stake measured parallel with side of car, and the second figure represents the depth measured at right angles to side of car.

**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 with joints well lapped or stripped at intervals of not less than 30 inches in height or 6 feet 0 inches in length, the sizes of hardwood stakes must not be less than:

- 4 by 2 inches for load-height, not exceeding 3 feet 0 inches.
- 2 by 4 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.
- 4 by 4 inches for load-height, between 3 feet 0 inches and 6 feet 0 inches.
- 4 by 5 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 2 by 4 Inch Hardwood Stakes.

One pair 3-inch saplings. Hardwood.

One pair 4 by 3 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.

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

Two pair 3¾ inch saplings.
Four pair 3-inch saplings.
Four pair 4 by 2 inch stakes.

Two pair 4 by 4 inch stakes.
Two pair 4¾-inch saplings.
Three pair 3 by 4 inch stakes.
Four pair 2 by 4 inch stakes.
Four pair 3¾-inch saplings.
Eight pair 3-inch saplings.

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.
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.

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.

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.
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 1½ by 2 inch stakes.
Six pair 1½ by 2 inch stakes.
Eight pair 8 by 2 inch stakes.
Sixteen pair 4 by 2 inch stakes.

Substitutes for Three Pair of 4 by 4 Inch 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.

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 Inch Hardwood Stakes.

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

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 Inch Hardwood Stakes.

Three pair 5-inch saplings.  
Five pair 4 by 4 inch stakes.  
Six pair 3 by 4 inch stakes.  
}

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.

Lumber Loaded on Top of Short Pieces on Single Cars, as in Fig. 5.

35. Long pieces so loaded as per Fig. 5 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 34.) The short lumber must be 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. 6 and 7.

38. This material may be carried on one car, either in the manner shown in Fig. 6, when all the material is of nearly equal length, or as shown in Fig. 7, 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. 6, 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. 7, 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. 6, 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. 5.

See Rules 4, 34, 35, 36, 37, 45, 48, 53 and 57.

MANNER OF LOADING LONG LUMBER ON TOP OF SHORT PIECES ON SINGLE CARS

CLEARANCE NOT LESS THAN 6" MINIMUM
CLEARANCE NOT LESS THAN 4" AT CLOSEST POINT

G-STRANDS OR 3-WRAPPINGS WIRE 1/8 DIAMETER
BEARING PIECES 10" WIDE-MINIMUM

G-STRANDS OR 3-WRAPPINGS WIRE 1/8 DIAMETER OR BOARDS 1"X3" STAKES 4"X5" 6" MIN.

FOR LOGS, PILING PROPS AND TELEGRAPH POLES USE 10-STRANDS OR 5 WRAPPINGS.
FIG. 6.

FIG. 7.
See Rules 4, 17, 31, 34, 35, 36, 38, 40, 42, 43, 44, 45, 46, 48 and 53.
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. 7, 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, on Fig. 6, must not project more than fifteen (15) feet from the center of the car bolster, and on Fig. 7 not more than eighteen (18) feet, and must be subject to restrictions in General Rules, so that the ends will not project too far beyond the side of the car 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 one-half (½) the length of the car four stakes on each side should be used; three stakes on each side being sufficient for shorter piles. All stakes should be fastened as shown in Figs. 6 and 7 and as provided for in Rules 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 carry-
ing 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. 6 and 7.

Lumber Loaded as per Figs. 8, 9, 10 and 11.

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, 34, 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. 13.

Lumber on Gondola Cars as per Figs. 12 and 13.

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
FIG. 8.
See Rules 4, 17, 34, 35, 36, 47 and 48.
For Width of Load See Table Rule 25.

FIG. 9.
See Rules 4, 17, 34, 35, 36, 47 and 48.
For Width of Load See Table Rule 25.
FIG. 10.
See Rules 4, 17, 31, 34, 35, 36, 47, 48 and 57.

(FOR LOGS ETC., USE 10-STRANDS OR 5-WRAPPINGS)

CLEARANCE NOT LESS THAN 6".

6-STRANDS OR 3-WRAPPINGS
WIRE 8" DIAMETER
STAKES 4" X 5"

2'-0" MINIMUM
3'-6" MAXIMUM

BEARING PIECES 10" WIDE-MINIMUM
CLEARANCE NOT LESS THAN 4" AT CLOSEST POINT.

FIG. 11.
See Rules 4, 17, 25, 34, 35, 36, 47, 48 and 57.
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. 12. 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, and to be fastened together with wire at center and either boards or wire at top, as specified in Rules 12, 13, 34, 35 and 36. Not more than two gondola cars must be used together.

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. 13. The material placed on these bearing-pieces may be loaded to the full width of car. Stakes must be placed as shown in Fig. 13, and must be wired above car sides and again at top.

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 (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 (1¾) inches thick must be six (6) inches
FIG. 12.
See Rules 4, 33, 36, 45, 48 and 51.
CLEARRAYANCE NOT LESS THAN 18".
CLEAT
CLEAT
CLEAT
CLEAT
C.
MINIMUM
MAXIMUM
STAKES 4X6".
10X10 MINIMUM.
+ SHEARING PIECES 1X5.
6 STRANDS OR 9 WRAPPINGS WIRE & DIAMETER.
6 STRANDS OR 9 WRAPPINGS WIRE & DIAMETER.
C.
C.
C.
1/4" CLEARANCE NOT LESS THAN 1 1/2".
FIG. 13.
See Rules 4, 34, 35, 36, 48, 51 and 52.

CLEARANCE: 2'-0" MINIMUM, 3'-6" MAXIMUM
6 STRANDS OR 5 WRAPPINGS WIRE 1/8 DIAMETER, OR BOARDS 1" X 3/4"

BEARING PIECES 10 X 10" MINIMUM

STAKES 4" X 5"

6 STRANDS OR 5 WRAPPINGS WIRE 1/8 DIAMETER, CLEARANCE NOT LESS THAN 4"
FIG. 12A.
End View of Fig. 12.
See Rules 51 and 57.

(FOR LOGS ETC. USE 10-STRANDS OR 5-WRAPPINGS)
6-STRANDS OR 3-WRAPPINGS
WIRE 6/8 DIAMETER
STAKES 4"x5"

DIAGONAL
BRACE

CLEAT NAILED TO BEARING PIECE BETWEEN STAKES AND SIDE PLANKS OF CAR

(FOR LOGS ETC. USE 10 STRANDS OR 5-WRAPPINGS)
6-STRANDS OR 3-WRAPPINGS
WIRE 6/8 DIAMETER OR BOARDS 1"x5"

STAKES 4"x5"

BEARING PIECES NOTCHED OVER SIDE PLANKS OF CAR

18" MINIMUM

BEARING PIECE 10"x10" MINIMUM

FILLING PIECES BETWEEN STAKES AND LADING TO BE FASTENED TO INSIDE OF STAKES.

FIG. 13A.
End View of Fig. 13.
See Rules 51 and 57.
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. 4, 5 and 7, 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. 14, with the large ends 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 1/8-inch diameter wire, passing over top of
FIG. 14.
See Rules 4 and 55.

LOADING OF LOGS

5-STRANDS WIRE 1/2 DIAMETER

CLEARANCE NOT LESS THAN 6"

STAKES 4" x 5"

NOT MORE THAN 10" ABOVE FLOOR...
lading and fastened to stake pockets. There must be at least two such ties for each tier. See Fig. 14.

Logs, Piling, Props, Telegraph and Telephone Poles.

56. When material of this kind is not loaded in pyramidal form the stakes must be as high as the lading, and must be tied together at the top with wire.

57. If the lading is more than four (4) feet high, opposite stakes must be bound together with wire at about one-third \( \left( \frac{1}{3} \right) \) the height above car floor after one-third \( \left( \frac{1}{3} \right) \) of the lading 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 stakes toward each other. The tops must also be tied with wire. (See Fig. 15.) This wiring must consist of not less than ten strands equal to five wrappings of good \( \frac{3}{8} \)-inch diameter wire, and must be tight. Bearing-pieces may be placed between lower and upper sections of load to facilitate application of wire after all the lading has been placed on the car. Stakes must be sound hardwood, and free from knots. If saplings are used, they must be at least six (6) inches in diameter. Stakes must incline toward center of car a total of about twelve (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 and projects above car sides, not less
FIG. 15.
See Rules 4 and 57.

LADING OF LOGS, PILING PROPS AND TELEGRAPHpoLES ON FLAT CARS.

10-STRANDS OR 5-WRAPPINGS WIRE 8" DIAMETER

STAKES 4"x5"

CLEARANCE NOT LESS THAN 6"
than three (3) hardwood stakes or live saplings should be well secured to either side of lading on inside of car for piling or props, not exceeding eighteen (18) feet in length. Stakes must be wired at top with ten strands, equal to six wrappings, of good \( \frac{1}{2} \)-inch diameter wire. If the lading extends more than three (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.

59. Logs, piling and telegraph poles loaded on two or more cars should conform to Figs. 5, 8, 9, 10, 11, 12 and 13, and paragraphs 35, 36, 37, 48, 49, 50, 51 and 62. If lading is less than four (4) feet high paragraph 56 should be followed, and when more than four (4) feet high paragraph 57 should be followed. The wiring of stakes should conform to paragraph 57 (Logs on Single Cars).

THE LOADING OF TAN BARK, LATH, SLAB WOOD, ETC.

Tan Bark 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. 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 \( \frac{1}{2} \)-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. 16.

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. At diagonally opposite corners of car, boards not less than one (1) inch by four (4) inches in section, spaced not more than two (2) feet apart, must be securely nailed to the inside of corner stake and the stake next to it, the top board to be not more than two (2) feet below the top of lading, in order to provide proper foothold.

In loading, strips should be arranged vertically inside of the cross boards, or bark set on end so as to permit space for foothold and handhold at the cross pieces. Fig. 16.

**Tan Bark 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. 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
Fig. 16.
For size of stakes see Rule 34.

LADING OF TAN BARK ON FLAT CARS

1" x 6" BOARDS
2-STRANDS WIRE 8" DIAMETER
FIG. 17.
For Size of Stakes See Rule 34.

LADING OF TAN BARK ON GONDOLA CARS

1" x 6" BOARDS

ONE STRAND WIRE 3/8 DIAMETER

2" x 4" PLANK
nailed to inside of the end and side stakes about twelve (12) inches below top of stakes. See Fig. 17.

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 \( \frac{1}{4} \)-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 and Lath.**

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 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
FIG. 17A.
For Size of Stakes See Rule 34.

LATH LOADED ON FLAT CARS

1"x6" BOARDS

2-STRANDS WIRE 1/8" DIAMETER

1"x6"
should govern the loading of lath, but, in addition, these rules should be followed:

Boards one (1) inch by (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. See Fig. 17a.

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. At diagonally opposite corners boards should be applied, to provide proper foothold and handhold, as required for tan-bark, except that these boards may be nailed to outside instead of inside of stakes, as required when loading tan-bark.
RULES GOVERNING THE LOADING OF TIES, FENCE POSTS, AND SIMILAR LADINGS ON OPEN CARS.

Shown in Fig. 18.

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

68. Gondola cars will be accepted with load not to exceed four (4) feet above the end gate of car. Each tier must be loaded flatwise in a pyramidal form above the end gate, so as not to wedge and spread the sides. Lading must not extend over the sides of car. (See Fig. 18.)

69. If the load extends more than twelve (12) inches above end gate at center, each pile must be tied across top by at least two binders, each consisting of one strand of good \( \frac{1}{8} \)-inch diameter wire, to be secured to the sides of the car with at least three nails or staples, to stake pockets, or through holes in top of flange on side of steel car. Each binder is to be fastened to each tie in passing over the load.

70. When wire is used it must not be less than good \( \frac{1}{8} \)-inch diameter, and but one strand may be used.

71. When sapling is used it must be of green timber, split, and not less than one and one half (1\( \frac{1}{2} \)) inches wide on the split or flat side.
FIG. 18.
See Rules 68 and 69.

LOADING OF TIES, FENCE POSTS AND SIMILAR MATERIALS ON GONDOLA CARS

WIRE OR SAPLING BINDERS
RULES GOVERNING THE LOADING OF LONG STRUCTURAL MATERIAL, PLATES, RAILS, GIRDERS, ETC., ON OPEN CARS. DETAILED INSTRUCTIONS.

Loads on Single Cars.

Rule 72. Large girders loaded on flat side on flat cars must always be carried upon bearing blocks not less than six (6) inches by twelve (12) inches in section, bolted to the car floor with 7/8-inch bolts. Bearing blocks 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. 20. Girders may be clamped together as shown in Fig. 21. 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. 46. If rivet holes are not available, longitudinal
FIG. 21.
See Fig. 20.

LARGE GIRDERS LOADED FLAT.

1" DIAM. FOR SINGLE LOADS
1/8" " DOUBLE "
CUT WASHER

4"X6" MIN. FOR SINGLE LOADS
6"X8" " DOUBLE "

10"X12" MIN. FOR DOUBLE LOADS,
WHEN BEARING PIECE MUST BE
BOLTED THROUGH FLOOR AND CLEAT

WEB FILLING PIECE FOR TWIN LOADS
LOCATED AS NEAR FLANGE AS POSSIBLE

CUT WASHER

CENTER OF CAR

CLEAT 2\x2 4\x2X18"
motion must be prevented by using clamps. See Fig. 21.

73. Large girders, loaded as shown in Fig. 22, must be secured to carrying car, as described in paragraph 72 and Fig. 21.

74. When loading short structural material on single gondola cars, in separate piles, as shown in Fig. 23, the pieces forming each pile must be lapped (see Figs. 25 and 26), 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 ten-penny nails. See Figs. 25 and 26. 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. 23 and 24.

75. Open girders, half-roof trusses, and similar material loaded on gondola cars, as shown in Fig. 28, must rest on two bearing-pieces not less than six (6) 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
FIG. 25.
For Size of Stakes See Rule 12.
See Rule 74, Figs. 23 and 24.

MANNER OF LOADING LIGHT STRUCTURAL MATERIAL IN BUNDLES ON SINGLE GONDOLA CARS.

SUFFICIENT BLOCKING TO ALLOW REMOVAL OF CHAINS WHICH WERE USED IN LOADING.
MANNER OF LOADING HEAVY STRUCTURAL MATERIAL, BEAMS AND CHANNELS ON SINGLE GONDOLA CARS.

SUFFICIENT BLOCKING TO ALLOW REMOVAL OF CHAINS WHICH WERE USED IN LOADING.
ten-penny wire nails, between tie boards against outside girders. Diagonal braces must be fastened to stakes and cross-tie boards.

(a) Deep girders, whenever possible, should be loaded horizontally. Girders having a depth more than two and one-half \((2 \frac{1}{2})\) 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. 29. 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. 30.

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 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 \((\frac{1}{2})\) 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 \((\frac{1}{3})\) of total length \((L)\) of load, (see Fig. 30), the opposite end must be securely bolted through bearing-
FIG. 28.
See Rule 75.

LADING OF STEEL HALF ROOF TRUSSES.
MANNER OF LOADING DEEP GIRDERS ON FLAT CARS

FIG. 29.
piece to floor by means of seven-eighths (\(\frac{7}{8}\)) inch bolts.

78. If the depth of load is more than twenty-four (24) inches, the bracing for bearing-piece on top of sides of car must be the same as shown in Fig. 46.

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.

81. 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 (\(\frac{1}{2}\)) 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. 32 and 33 show substantially how both bearing-pieces are to be made and secured.

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

83. The idlers used with loads as shown in Fig.
FIG. 30.

BRACING FOR LADING OF LARGE GIRDER

CUT WASHER

7/8 BOLT, MINIMUM

2" BLOCKING MNI.

CLEATS BOLTED OR NAILED TO FLOOR

AND CUT WASHERS

3/8" X 6" CLEAT

4" X 6" CLEAT

BEARING PIECE 10" DIA.

SPIKED

3/8" DIAGONALS

8" UPRIGHT
FIG. 31.

MANNER OF LOADING OVERHANGING LOADS OF STRUCTURAL MATERIAL ON STEEL GONDOLA CARS WITH BEARING PIECE LOCATED OVER BOLSTER.

WHERE MATERIAL IS FLEXIBLE THIS BEARING PIECE MAY BE OMITTED BUT LOAD MUST BE CLAMPED TO PREVENT SIDE MOTION.
FIG. 32.
See Rules 7 and 81.

MANNER OF BLOCKING ROUND BEARING PIECES.

2" x 8" DIAGONAL BRACES SPIKED TO CARSIDES AND FLOOR 10" DIA. MINIMUM. PIECE AND UPRIGHT.

PIECE 2" x 8" SPIKED ACROSS DIAGONAL BRACES IMMEDIATELY BELOW BEARING PIECE

3" x 6" DIAGONALS
FIG. 33.
See Rules 7 and 81.

MANNER OF BLOCKING RECTANGULAR BEARING PIECES.

2"x8" DIAGONAL BRACES SPIKED TO CAR SIDES AND FLOOR

8"x10" UPRIGHT.

PIECE 2"x8" SPIKED ACROSS DIAGONAL BRACES IMMEDIATELY BELOW BEARING PIECE

1" BLOCKING BETWEEN CAR SIDES AND UPRIGHT WHEN BEARING PIECE IS NOT NOTCHED.

8"x10" MINIMUM.

SPIKED

3"x6" DIAGONALS.

2"x8" DIAGONAL BRACES SPIKED TO CAR SIDES AND FLOOR

8"x10" UPRIGHT

PIECE 2"x8" SPIKED ACROSS DIAGONAL BRACES IMMEDIATELY BELOW BEARING PIECE

3"x6" DIAGONALS.

BEARING PIECE NOTCHED AT CAR SIDES
22 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 Figs. 30 and 31 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.

85. This method of loading may be made use of to load long lattice girders, which 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 absolutely necessary. See Figs. 34, 35 and 36.

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 overhanging ends and to the bearing-pieces, as shown in Fig. 35. Longitudinal motion must be prevented by the use of plates or clamps, as explained in paragraph 72.

**Loading Flexible Plates on Single Cars.**

88. When plates are loaded on single wooden underframe cars, and the length of the plates is such that it becomes necessary to lap the plates on each other at the center of the car, they must be braced to pre-
FIGS. 34 and 35.
See Rules 72, 85, 86, 87 and Fig. 36.

MANNER OF LOADING LONG LATTICE GIRDER

MUST NOT EXCEED 60 FEET

6"x8" 10"x12" 4"x4"

1"ROD MINIMUM
FASTENED TO ANGLE

ANGLE BOLTED TO GIRDER
FIG. 36.

See Rules 72, 85, 86 and Figs. 34 and 35.
vent shifting sidewise and bearing-pieces not less than six (6) by eight (8) inches in section and of 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. 37 and 38. Wooden underframe cars with two truss rods must not be loaded in this manner.

89. For loads on GR, GRA, GS, GSA, GSB, GSC, GSD and FM cars and cars of similar construction these bearing pieces are not required.

Twin Loads.

Rule 90. Material loaded on gondola cars with drop ends or on flat cars, as shown in Figs. 39 and 41, must have one bearing-piece not less than ten (10) inches wide by twelve (12) inches deep, secured to the floor of each car with two ¾-inch bolts, and lateral and longitudinal motion must be prevented in the manner described in Rule No. 72, Fig. 21, using six (6) inch by eight (8) inch top clamping-pieces and 1½-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 "T" beams, or similar material, lying flat, and if 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. In case of gondola cars, a clearance of at least eighteen (18) inches on each side between the
FIG. 37 and 38.
See Rules 88 and 89.

LOADING FLEXIBLE PLATES ON SINGLE CARS.

BRACING TO PREVENT SIDE SHIFTING
load and car sides and end gate stops at narrowest point must be provided for curving. See Fig. 12.

92. Material loaded on gondola cars without drop ends, as shown in Figs. 40, 42 and 43, 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. 32 and 33; also Figs. 44, 45, 45-A and 45-B.

Figs. 45-A and 45-B show respectively the manner of blocking and bracing bearing-pieces on steel gondola cars with inside stake pockets and manner of blocking and bracing bearing-pieces on steel gondola cars without inside stake pockets.

93. Long flexible material, like plates, etc., which can not be loaded as shown in Fig. 24, must be loaded on two bearing-pieces, and two sliding-pieces as in Figs. 41, 42 and 43. The two sliding-pieces must be four (4) inches lower than the bearing-pieces and must have flat iron ½ inch by six (6) inches, secured to their upper sides either with spikes or lag screws at each end. These iron pieces, which are intended to facilitate curving, must extend at least sixteen (16) 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 to prevent it from shifting, in the same manner as described in Rules 72 and 81.

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. 42, and when the load so carried is equal to one-half (½) the capacity or
FIG. 39.

LADING OF LONG MATERIAL ON FLAT OR DROP-End GONDOLA CARS.

1/2" BOLT THROUGH FLOOR 6"x8" TOP CLAMP

CLEAT 2"x4"x18"

2"x12" SPACING BLOCK 10"x12" BEARING BLOCK
FIG. 40.

LOADING OF LONG MATERIAL ON GONDOLA CARS

1 1/8" BOLT
6" x 8" TOP CLAMP

2" x 12" SPACING BLOCK
10" x 12" BEARING BLOCK

2" x 8" SPIKED TO SIDES OF CAR

FIG. 41.

LOADING OF LONG FLEXIBLE MATERIAL ON FLAT OR DROP END GONDOLA CARS

1 1/8" BOLT THROUGH FLOOR 1 /2" x 6" W.I.-BEARING PLATE

THIS BLOCKING TO BE 4" LOWER THAN BLOCKING NEAR END OF LADING
FIG. 42.

LOADING OF LONG FLEXIBLE MATERIAL ON GONDOLA CARS NOT HAVING DROP ENDS

BOLT THROUGH BEARING PIECE  8 X 10 PLATE

BEARING PIECES NEAR END OF CAR.

FIG. 43.

LOADING OF LONG FLEXIBLE MATERIAL ON GONDOLA CARS NOT HAVING DROP ENDS

BOLT THROUGH BEARING PIECE  8 X 10 PLATE
FIG. 44.
See Rules 7 and 92.

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

CUT WASHER

1 1/4 W-I-ROD

8 x 10 or 10" DIA

CLEAT SPIKED TO BEARING PIECE TO PREVENT LATERAL MOTION

2" x 8" "BOLTS

CLEAT NAILED ON

2" x 8" DIAGONALS SPIKED TO SIDES AND FLOOR

CLEAT NAILED ON

2" x 8" PIECE SPIKED ACROSS DIAGONALS IMMEDIATELY BELOW BEARING PIECE.
FIG. 45.
See Rules 7 and 92.

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

1 1/4 W.I. ROD
CUT WASHER

CLEAR SPiked TO
BEARING PIECE TO
PREVENT LATERAL
MOTION

2" x 8" PIECE SPIKED TO
DIAGONALS IMMEDIATELY
BELOW BEARING PIECE

4" x 8" SPIKED TO
CAR SIDES

2" x 8" DIAGONALS SPIKED
FLOOR AND CAR SIDES
over, the bearing-pieces must be secured with lateral bracing-pieces, as shown in Fig. 46, 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. 12 and 12-A.

96. If the lading requires one bearing-piece and two 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. 43, and the sliding-pieces must be provided with flat iron, 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. 40, 42 and 43, 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.

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 chocked to prevent side and end motion.

98-A. Pig iron, short billets, small castings and similar
FIG. 45A.
See Rules 7 and 92.
MANNER OF BLOCKING AND BRACING BEARING PIECE ON STEEL GONDOLA CARS WITH INSIDE STAKE POCKET.

1½ x 6¼ IN. IRON SECURED WITH LAG SCREWS AT EACH END 2½ x 2¼ CLAMP

2 x 8 ANGLE 8 x 10 BOLTS 10 x 10 MIN.

6 x 10 CLEARANCE
3 x 8 POST 3 x 8 BOLTS
3 x 8 BOLT.

CLEATS NAILLED ON

4 x 4 STAKE TO FIT NEATLY IN STAKE POCKET.
FIG. 45B.
See Rules 7 and 92.

MANNER OF BLOCKING AND BRACING BEARING PIECE ON STEEL GONDOLA CARS WITHOUT INSIDE STAKE POCKETS.

$\frac{1}{4}$" x 6" IRON SECURED WITH LAG SCREWS AT EACH END

3" x 2$\frac{1}{2}$" CLAMP

$\frac{3}{4}$" BOLTS

10" x 10" MIN.

CLEATS

3" x 8"

3" x 3" ANGLE

$\frac{3}{4}$" BOLTS

8" x 10" POST

$\frac{3}{4}$" BOLTS

10" x 10" MIN.

CLEATS NAIL ED ON

$\frac{1}{2}$" x 3" LAG SCREWS

Bearing over top flange

PIECE NOTCHED

3" BOLTS

6" x 10"
See Figs. 45A and 45B.

MANNER OF BLOCKING BEARING PIECE ON STEEL GONDOLA CARS

\[\frac{3}{4} \times 2\frac{1}{2} \text{ CLAMP}\]

\[\frac{3}{4} \text{ BOLTS}\]

\[\frac{1}{2} \times 3\text{ LAG SCREWS}\]

\[\frac{3}{4} \text{ BOLTS}\]
material must be loaded in gondola cars or cars having end and side protection. Hopper cars when loaded with this material must have the hopper doors securely boarded over. When loaded on cars with flat floors, the load must be placed as nearly as possible over bolsters in such manner that none of the lading can fall or rest on the drop doors.

NOTE:—Classes GB and GD wooden hopper cars should have the planking over the hopper doors applied immediately above the lower chute rest or bed irons. Classes GSA, GSC and GSD steel cars with drop doors are not to be boarded over, but material must be so loaded that it will not fall onto the drop doors in transit.

99. Single flat cars, when used for loading this material, 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. 21.

100. Material of this description, when loaded on two or more cars, should be secured as shown in Figs. 47, 48 and 49.

101. The intermediate sliding-piece or pieces must be two (2) inches lower for material six (6) inches high or over, and four (4) inches lower than the main bearing-piece for material less than six (6) inches high, and must have flat iron not less than ¼ inch by six (6) inches in section, secured to their upper sides, either with spikes or lag screws at each end. These iron pieces, which are intended to facilitate curving, must extend at least sixteen (16) inches on each side of lading, and must
FIG. 46.
STRUCTURAL MATERIAL LOADED ON FLAT CARS

FIG. 47.
Plan View of Lading Shown in Fig. 47.

FIG. 48.
be coated with grease before the lading is put upon them.

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 ½-inch rods, as shown in Figs. 47 and 49.

103. All structural material and plates more than sixty (60) feet long, also 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. 52 and 53. The bracing shown is for long girders. For other material the bracing must be equally strong.
FIG. 50.

See Rules 103, 104 and 111.

VERTICAL LADING OF LONG GIRDER
LOCATION OF BEARING PIECE FOR BOLSTER
FOR TWIN LOADS
CARS EQUIPPED WITH STEEL UNDERFRAME

AT LEAST TWO 7/8 BOLTS
MUST BE USED AT EACH END OF DIAGONAL BOLSTER

A WROUGHT IRON PLATE TO ACT AS A WASHER TO TAKE ALL BOLTS THROUGH DIAGONAL BOLSTER
MUST BE PLACED UNDER FLOOR

KING PIN SHOULD BE SUFFICIENTLY LONG TO REST ON CENTER SILL COVER PLATE WHICH SHOULD NOT BE CUT TO ALLOW KING PIN TO PASS THROUGH.
FIG. 51.
See Rules 103 and 111.

HORIZONTAL LOADING OF LONG GIRDERs ON PIVOTED BOLSTERS. CARS EQUIPPED WITH STEEL UNDERFRAME.

AT LEAST TWO 3/8" BOLTS MUST BE USED AT EACH END OF DIAGONAL BOLSTER.

3/8" WROUGHT IRON PLATE TO ACT AS A WASHER TO TAKE ALL BOLTS THROUGH DIAGONAL BOLSTER MUST BE PLACED UNDER FLOOR.

KING PIN SHOULD BE SUFFICIENTLY LONG TO REST ON CENTER BILLET COVER PLATE WHICH SHOULD NOT BE CUT TO ALLOW KING PIN TO PASS THROUGH.

BOLTS TO BE LOCATED AS NEAR TO GIRDER AS POSSIBLE.

4" X 6"-MIN.
1 1/4" BOLT-MIN
2" X 8"-MIN.

TOP AND BOTTOM PLATES FOR CENTER AND TOP PLATES FOR SIDE BEARINGS TO BE 3/8" STEEL PLATES.

COUNTERSUNK NUT, CARE TO BE TAKEN THAT ROD DOES NOT PROJECT THROUGH NUT.

BOTTOM PLATES FOR SIDE BEARINGS TO BE 3/8" STEEL PLATES.
FIG. 52.
See Rules 103 and 104 and Figs. 53 and 53A.

NOTE:
Center plates and side bearings must be well coated with grease before the ladder is placed on them.
FIG. 53.
See Rules 103 and 104.
FIG. 53A.
Side View Fig. 53.
See Rules 103 and 104 and Figs. 52 and 53.

ANGLE OR CHANNEL

GIRDER

ANGLE IRON
BOLTED TO GIRDER
# LIST OF MATERIAL.

<table>
<thead>
<tr>
<th>NAME</th>
<th>Designation</th>
<th>No. Wanted</th>
<th>For girders weighing not more than 30,000 lbs.</th>
<th>For girders weighing more than 30,000 lbs. and not exceeding 72,000 lbs.</th>
<th>For girders weighing more than 72,000 lbs. and not exceeding 115,000 lbs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bolster</td>
<td>A</td>
<td>1</td>
<td>8' x 10' wide x 9' 6&quot;</td>
<td>10' x 14' wide x 9' 6&quot;</td>
<td>12' x 16' wide x 9' 6&quot;</td>
</tr>
<tr>
<td>Struts</td>
<td>B</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Center plate backing</td>
<td>C</td>
<td>1</td>
<td>3' x 12' x 5'</td>
<td>3' x 12' x 5'</td>
<td></td>
</tr>
<tr>
<td>Side bearing backing</td>
<td>D</td>
<td>2</td>
<td>3' x 10' x 5'</td>
<td>3' x 10' x 5'</td>
<td>*** x 12'</td>
</tr>
<tr>
<td>Bolster side steps</td>
<td>E</td>
<td>2</td>
<td>6' x 3' x 3'</td>
<td>6' x 3' x 3'</td>
<td></td>
</tr>
<tr>
<td>Side bearing plate, bottom</td>
<td>F</td>
<td>1</td>
<td>6' x 1 1/2 x 1 1/2</td>
<td>6' x 1 1/2 x 1 1/2</td>
<td></td>
</tr>
<tr>
<td>Side bearing plate, top (bent)</td>
<td>G</td>
<td>1</td>
<td>12&quot; x 5/8 x 12&quot;</td>
<td>12&quot; x 5/8 x 12&quot;</td>
<td></td>
</tr>
<tr>
<td>Center plate, bottom</td>
<td>H</td>
<td>1</td>
<td>12&quot; x 5/8 x 12&quot;</td>
<td>12&quot; x 5/8 x 12&quot;</td>
<td></td>
</tr>
<tr>
<td>Center plate, top</td>
<td>I</td>
<td>1</td>
<td>12&quot; x 5/8 x 12&quot;</td>
<td>12&quot; x 5/8 x 12&quot;</td>
<td></td>
</tr>
<tr>
<td>Center pin</td>
<td>J</td>
<td>1</td>
<td>2 1/2&quot; diam.</td>
<td>2 1/2&quot; diam.</td>
<td></td>
</tr>
<tr>
<td>Strut straps</td>
<td>K</td>
<td>4</td>
<td>5&quot; x 3/4&quot; x 1/4&quot;</td>
<td>5&quot; x 3/4&quot; x 1/4&quot;</td>
<td>5/8&quot; x 1 1/2&quot;</td>
</tr>
<tr>
<td>Strut angles</td>
<td>L</td>
<td>4</td>
<td>3 1/2&quot; x 5&quot; x 3/8 x 9/16&quot; long</td>
<td>3 1/2&quot; x 5&quot; x 3/8 x 13 1/2&quot; long</td>
<td>3 1/2&quot; x 5&quot; x 3/8 x 16&quot; long</td>
</tr>
<tr>
<td>Flange clamps</td>
<td>M</td>
<td>2</td>
<td>6&quot; x 3/4 x 1 1/4&quot;</td>
<td>6&quot; x 1 1/2 x 1 1/4&quot;</td>
<td>6&quot; x 1 1/2 x 1 1/4&quot;</td>
</tr>
<tr>
<td>Brace rods</td>
<td>N</td>
<td>2</td>
<td>1&quot; rod or 2 1/2&quot; x 1/2&quot; flat</td>
<td>1 1/2&quot; rod or 3&quot; x 1 1/2&quot; flat</td>
<td>1 1/2&quot; rod or 3&quot; x 1 1/2&quot; flat</td>
</tr>
<tr>
<td>Bolts for center plate backing</td>
<td>O</td>
<td>6</td>
<td>5/8&quot; diam.</td>
<td>5/8&quot; diam.</td>
<td>5/8&quot; diam.</td>
</tr>
<tr>
<td>Bolts for flange clamps</td>
<td>P</td>
<td>4</td>
<td>3/4&quot; diam.</td>
<td>3/4&quot; diam.</td>
<td>3/4&quot; diam.</td>
</tr>
<tr>
<td>Bolts for strut straps</td>
<td>Q</td>
<td>8</td>
<td>3/4&quot; diam.</td>
<td>3/4&quot; diam.</td>
<td>3/4&quot; diam.</td>
</tr>
<tr>
<td>Bolts for strut angles</td>
<td>R</td>
<td>4</td>
<td>3/4&quot; diam.</td>
<td>3/4&quot; diam.</td>
<td>3/4&quot; diam.</td>
</tr>
<tr>
<td>Bolts for strut tops</td>
<td>S</td>
<td>4</td>
<td>3/4&quot; diam.</td>
<td>3/4&quot; diam.</td>
<td>3/4&quot; diam.</td>
</tr>
<tr>
<td>Strut top irons</td>
<td>U</td>
<td>2</td>
<td>6&quot; channels, or angles 4' 10&quot; long</td>
<td>6&quot; channels, or angles 4' 10&quot; long</td>
<td>6&quot; channels, or angles 4' 10&quot; long</td>
</tr>
</tbody>
</table>

*May be made of two pieces, securely bolted together. †To be 1/2" less than flange of girder.
104. The minimum dimensions of detail parts for different weights of lading are given in the table on page 90.

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

B. 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. 52, 53 and 53-A.

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

D. Bolsters, 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. 52.

E. Filling-pieces should be placed between stringers of the same length and directly underneath center plate backing. Six bolts should be used to tie the two pieces together.

F. 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.

G. 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.

H. 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.

I. 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.

K. 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. 54, or upside down, as shown in Fig. 55.

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

MANNER OF LOADING TURNTABLES

INVERTED LOADING OF TURNTABLES

See Rules 105, 107, 109, 110 and 111.
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. 54.

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 Fig. 54, or if rivet holes are available in the lower flanges, it may be held with four (4) three-fourths (¾) 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. 56.
See Rules 113 and 114.

WROUGHT AND CAST IRON PIPE ON FLAT CARS
PIECE MORE THAN 12" AND LESS THAN 24" IN DIAM.
FIG. 57.
See Rules 112 and 114.
LOADING TWO LENGTHS OF ALL PIPE OR TUBING 12" OR LESS IN DIAMETER IN GONDOLA CARS.

BEARING STRIPS BETWEEN EACH COURSE 1" THICK BY NOT LESS THAN 4" WIDE FOR W.I. PIPE AND FOR CAST IRON PIPE OF SUCH THICKNESS AS TO GIVE CLEARANCE BETWEEN BELL END AND BODY OF PIPE, BUT MUST NOT BE LESS THAN 2" THICK.
FIG. 59.

End View, as per Figs. 57 and 58. See Rules 112 and 114.

10 STRANDS WIRE 1/8 DIA

2 0.0 NAIL TO PREVENT STAKE FROM LIFTING. NAIL MUST EXTEND THROUGH STAKE.

ENLARGED VIEW SHOWING CHOCK AT SIDE OF PIPE ON EACH BEARING PIECE.

3" CHOCK FOR 12" PIPE SECURED WITH FOUR 8-0 NAILS
2" " LESS THAN 12" PIPE SECURED WITH FOUR 6-0 NAILS
RULES GOVERNING THE LOADING OF PIPE
ON OPEN CARS.

112. Wrought or cast-iron pipe twelve (12) inches or less in diameter should be loaded in gondola cars. Gondola cars loaded higher than top of sides with pipe twelve (12) inches or less in diameter should have the stakes pulled together after pipe has been loaded to the top of the sides, by means of a rod with turnbuckles or any other suitable means, until the side stakes are slightly inclined toward the center of the car. Opposite stakes should then be secured by means of ten (10) strands or five (5) turns of good \( \frac{3}{8} \)-inch diameter wire immediately above the car sides, and further loading of pipe should be placed on this wire. Top of stakes should then again be secured by wire; but, where facilities do not make it possible to properly apply the intermediate wiring, bearing pieces not less than four (4) inches wide and spaced not more than six (6) feet apart may be placed between consecutive courses of pipe. These bearing pieces must be at least one (1) inch thick for wrought and two (2) inches thick for cast-iron pipe. Each course of pipe should be securely blocked on both sides to prevent rolling. The same precaution should be taken to securely tie the tops of opposite stakes, as above prescribed in this paragraph. There should not be less than three (3) stakes on each side of each pile.

113. All cast or wrought-iron pipe more than twelve (12) inches and less than twenty-four (24) inches in diameter must be loaded with bell or sleeve ends toward same end of car and interlocked with each other. Ends of pipe must not be less
FIG. 60.
See Rules 115 and 117.

LADING OF PIPE ON FLAT CARS
PIPE 24" OR MORE IN DIAMETER
than eighteen (18) inches from end of car. The bell or sleeve ends of top course must overlap those immediately below. Each course must be separated from the other immediately below by a bearing-piece of timber not less than two (2) inches thick by four (4) inches wide for wrought, and four (4) inches thick by five (5) inches wide for cast-iron pipe, extending the full width of lading. The bearing-piece at bell or sleeve end of pipe to be placed as near the bell or sleeve end of the pipe as location of stake pockets on car will permit.

114. There must not be less than three pairs of stakes to each pile when the material is eighteen (18) feet or less in length, or more than four (4) feet high above top of sides when gondola cars are used. The tops of each pair of stakes to be held together by means of ten strands or five turns of good ½-inch diameter wire resting on the pipe. For pipe more than eighteen (18) feet long there must be at least four pairs of stakes, but where dunnage strips are used between consecutive layers of pipe three (3) pairs of stakes should be sufficient.

115. All wrought or cast-iron pipe twenty-four (24) inches or more in diameter must be loaded in pyramidal form with all bell or sleeve ends toward the same end of car, and interlocking with each other. The ends of the pipe must not be less than eighteen (18) inches from the end of the car. The bell or sleeve ends of the top course must overlap those of the courses immediately below. The bottom course must be securely blocked on each side of each pile with not less than three blocks eight (8) inches long, and of a height equal to one-quarter (¼) the diameter of the pipe. These blocks must
be neatly fitted to the pipe, shouldered and beveled on the outside and secured against displacement. Each end of the bottom course must be provided with end blocking not less than four (4) inches by five (5) inches in section, securely fastened to the floor of the car.

116. Blocking of more than fourteen (14) inches in height will not be required, but on ladings of pipes three (3) feet or over in diameter there must be additional blocking formed by a plank not less than two (2) inches thick, fitted under the outside of lading and spiked to each stake with four twenty-penny nails.

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.

RULES GOVERNING THE LOADING OF STONE ON OPEN CARS.

GONDOLA CARS.

118. All stone should preferably be loaded in flat bottom gondola cars. Stone of a kind, grade or quality that without proper protection, are likely to break, chip, spawl or otherwise become damaged, must rest on soft wood strips placed flat or lengthwise of car floor, and each stone or tier of stone must be well blocked or braced both laterally and longitudinally.

119. Dressed stone, including, granite, marble, also such stone as rip-rap, spawls, paving block, etc., that can be loaded and unloaded without the use of a crane or hoist, MUST ALWAYS BE LOADED IN FLAT BOTTOM GONDOLA CARS, and must be stripped and blocked as provided for in Rule 118.

120. All block and break-water stone, including similar sized quarry products, resting on uneven faces must be wedged to prevent stone from rocking.
121. Grindstones four (4) feet and over in diameter should be loaded as per Fig. 61. The bottom stone of each tier should rest evenly on four heaps of stone turnings or grindings, six or eight inches deep, placed upon the floor of the car. The successive layers of stones must be separated by two one (1) inch by two (2) inch soft wood 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 (6) inches above top of tier, and all the stakes must be tied together at the top by one (1) inch by four (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 wooden floors each stone must be chocked as shown for flat cars, Fig. 62.

122. In no case, excepting grindstone lading, is a stone or layer of stone that is three (3) inches or less in thickness to project above the gondola sides or ends more than one-half the thickness of such stone or layer nor more than two-thirds the thickness of any stone or layer if more than three (3) inches in thickness, unless adequately protected.

*NOTE.—Brick, fire-proofing, sewer pipe and similar material may be loaded over the entire floor of gondola cars, with or without drop doors.

FLAT CARS.

123. Thick flagging, block or breakwater stone with approximately straight faces and not more than one stone in height, when loaded on flat cars, must rest on two or more soft wood strips, of sufficient thickness to keep the stone clear of car floor, placed flat and lengthwise of car. Each stone must be cleated to prevent both side and end shifting. Where side cleats cannot be applied due to stone being full width of car short hardwood side stakes must be placed in each pocket with hardwood boards one (1) inch by four (4) inches, nailed to inner face of stakes.
FIG. 61.
See Rule 121.

MANNER OF LOADING GRINDSTONES
IN GONDOLA CARS

HARDWOOD STAKES TO FILL HOLES THROUGH STONES

STONE GRINDINGS 6" OR 8" HIGH

1"x4" BOARDS WELL NAILED ON EACH SIDE OF STAKES

1"x2" SOFTWOOD STRIPS TO BE PLACED BETWEEN STONES CROSSWISE OF CAR
124. Flagging, sawed or dressed stone loaded in tiers must rest on two or more soft wood strips, of sufficient thickness to keep the stone clear of the car floor, placed flat and lengthwise of car, and be blocked or braced sidewise and endwise to prevent breaking, chipping, spawling or other damage in transit. Hardwood side and end stakes must be placed in the stake pockets and hardwood strips must be nailed to the inside face of the stakes to prevent stone from shifting over side or end of car. End stakes must extend four (4) inches above top of load and opposite end stakes wired together at top with three (3) wrappings equal to six (6) strands of good $\frac{1}{2}$" diameter wire. WHEN THE LOAD IS THIRTY (30) INCHES OR LESS IN HEIGHT the side stakes must extend to full height of load. WHEN THE LOAD IS OVER THIRTY (30) INCHES IN HEIGHT the side stakes must extend four (4) inches above full height of load and the top of opposite stakes wired together with two (2) wrappings equal to four (4) strands of good $\frac{1}{2}$" diameter wire.

125. Where flat cars are not provided with pockets for end stakes, the necessary end stakes should be secured at floor line as provided for in Fig. 16.

126. Grindstones four (4) feet and over in diameter should be loaded as per Fig. 62. The bottom stone of each tier should rest on two one (1) inch by two (2) inch soft wood strips nailed flat and crosswise to floor of car, and be held in place by four (4) hardwood chocks at least twelve (12) inches long and not less than four (4) inches high, securely spiked to floor of car. The successive stones of each tier must rest on similar soft wood strips. HARDWOOD STAKES TO FILL THE HOLES in the grindstones must be placed through each tier, extending from floor of car to six (6) inches above top of tier, and all the stakes must be tied together at the top by one (1) inch by four (4) inch boards, fastened with four (4) ten-penny nails to the side of each stake. Lading consisting of single stones must rest on soft wood strips and each stone chocked as above described.
MANNER OF LOADING GRINDSTONES ON FLAT CARS.

HARDWOOD STAKES TO FILL HOLES THROUGH STONES.

HARDWOOD CHOCKS AT LEAST 12" LONG AND NOT LESS THAN 4" HIGH SECURELY SPIKED TO FLOOR OF CAR.

1"x4" BOARDS WELL NAILED ON EACH SIDE OF STAKES.

1"x2" SOFTWOOD STRIPS TO BE PLACED BETWEEN STONES CROSSWISE OF CAR.

1"x2" SOFTWOOD STRIPS TO BE NAILED TO FLOOR, CROSSWISE OF CAR.
RULES GOVERNING THE LOADING OF CYLINDRICAL BOILERS, SHELLS AND TANKS.

127. Lading of this description over eight (8) feet in diameter when loaded on single flat or gondola cars with sides less than thirty (30) inches in height, should be secured with two bands of not less than \( \frac{3}{4} \)-inch round iron or flat bands of equal section in addition to the usual blocking. When eight (8) feet or less in diameter, they may be secured with the proper chocking, blocking and stakes necessary to prevent rolling and end shifting, the height of side chocking to be at least one-seventh (\( \frac{1}{7} \)) of the diameter. When loaded on two or more cars, the lading should be secured to cars with two bands of not less than \( \frac{3}{8} \)-inch round iron or flat bands of equal section in addition to the usual blocking.

MATERIAL LOADED IN CLOSED CARS.

128. Lading must be secured in closed cars so that it will not come in contact with side doors or roll and shift in transit. The agent must see that this rule is strictly enforced.

129. Ties eight (8) feet or more in length, or similar material, which cannot conform to this rule, may be loaded longitudinally in four (4) tiers, as per Fig. 63 in which case the ends of the tiers projecting into the doorway must also be raised, and rest on pieces not less than six (6) inches thick, laid crosswise on floor of car. If the length of the car is such that ties cannot be piled in four (4) tiers, three (3) tiers may be used, as shown in Fig. 64 in which case the spaces between the tiers must be blocked to prevent and shifting of the middle tier. When loaded in three (3) or four (4) tiers, as indicated, the door protecting strips need not be applied.

130. Cars equipped with protection slats nailed to outside of door posts, or to doors, will not be accepted. Cars without doors must have the lading protected from falling or rolling out of car by
FIG. 63.
See Rule 129.
FIG. 64.
See Rule 129.
strips or slab wood not less than one and one-half (1½) inches thick at center, nailed to inside of door post and sufficiently close to floor of car and to each other to prevent lading from passing between them.

131. 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 place. See Fig. 65.

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 four (4) inches thick, extending from side to side of car and spaced not less than four (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 four (4) inches thick, nailed to inside of door posts.

132. Wheels should be loaded as per Fig. 66. At end of car the wheels should be laid flat, then two rows, one on each side of car, touching side lining and inclining toward center of car, should rest against those loaded 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 four (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 three (3) inches thick nailed to inside of door posts.

133. Material such as scrap junk must be loaded in box or stock cars, or cars equipped with suitable racks extending to top of load. When material of this nature is loaded in stock or racked cars, the spaces between the slats must be protected, to prevent any of the lading from passing through; and when loaded in open cars, the tops of load must be securely tied down with a sufficient number of strands of good ⅛" diameter wire to prevent any of the lading from rolling off.

134. Sewer Pipe, drain tile, etc., in closed cars, should be loaded in tiers separated by lath or similar material. The space between the tiers at door opening should be bulkheaded as per Fig.
FIG. 65.
See Rule 131.

MANNER OF LOADING TIRES IN BOX OR STOCK CARS.

END PROTECTION STRIPS NOT LESS THAN 4" THICK.

PROTECTION STRIPS NOT LESS THAN 4" THICK.

CHOCKS NOT LESS THAN 4" THICK, NAILED TO FLOOR.
FIG. 66.

See Rule 132.
67. When one-half or more of one length of pipe extends by door opening, such tier must be protected on each side by means of sound wood two (2) inches by four (4) inches in section, nailed to inside of plate, and secured at floor by means of cleat spiked to floor of car. If full length of pipe extends by door opening, such tier must be protected by two pieces of two (2) inch by four (4) inch sound wood on each side, secured as specified above for single piece on each side.
MANNER OF LOADING SEWER PIPE IN CLOSED CARS.

SEWER PIPE IN CLOSED CARS.

CLEAT SPIKED TO FLOOR.

CLEAT SPIKED TO SIDE PLATE AND CLEAT.

2"X4" POST SPIKED TO SIDE PLATE AND CLEAT.

1"X6" BRACING.

RACKS BETWEEN PILES TO BE OF 3/4"X1½"X4'-0" LATH.
**INDEX.**

<table>
<thead>
<tr>
<th>Rule</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Instructions</td>
<td>1, 15</td>
</tr>
<tr>
<td>Bearing Pieces</td>
<td>12</td>
</tr>
<tr>
<td>Braces</td>
<td>12</td>
</tr>
<tr>
<td>Brakes—Number of</td>
<td>4</td>
</tr>
<tr>
<td>Brakes—Clearance</td>
<td>4</td>
</tr>
<tr>
<td>Brakes—Hand</td>
<td>4, 18</td>
</tr>
<tr>
<td>Cars used for shipments, Condition of</td>
<td></td>
</tr>
<tr>
<td>Height and width of lading</td>
<td>6</td>
</tr>
<tr>
<td>Idler Car—Use of</td>
<td>9, 10, 17, 21</td>
</tr>
<tr>
<td>Lading—Weight of</td>
<td>15</td>
</tr>
<tr>
<td>Lading—Maximum Weight of</td>
<td>3</td>
</tr>
<tr>
<td>Lading—Height and Width of</td>
<td>6, 26</td>
</tr>
<tr>
<td>Lading—Not Acceptable for</td>
<td></td>
</tr>
<tr>
<td>Shipment on Top of Cars</td>
<td>7</td>
</tr>
<tr>
<td>Loads—Carried on one Truck</td>
<td>8</td>
</tr>
<tr>
<td>Loads—Projecting or Overhanging on Single Cars</td>
<td>9</td>
</tr>
<tr>
<td>Loads—Width of Overhanging</td>
<td>11</td>
</tr>
<tr>
<td>Maximum Weight of Lading</td>
<td>3, 31</td>
</tr>
<tr>
<td>Overhanging Load on Single Cars</td>
<td>9</td>
</tr>
<tr>
<td>Loads Projecting Over End Sills</td>
<td>9</td>
</tr>
<tr>
<td>Overhanging Loads—Width of</td>
<td>11</td>
</tr>
<tr>
<td>Stakes, Stake Pockets</td>
<td>12, 14</td>
</tr>
<tr>
<td>Stakes—Tying Together at Top</td>
<td></td>
</tr>
<tr>
<td>Side Bearing Clearance</td>
<td>5</td>
</tr>
<tr>
<td>Width of Overhanging Load</td>
<td>11</td>
</tr>
<tr>
<td>Single Loads of Sawed Lumber</td>
<td>12</td>
</tr>
<tr>
<td>Application of Additional Stake Pockets to Comply with Rules</td>
<td>14</td>
</tr>
<tr>
<td>Weight of Lading</td>
<td>15</td>
</tr>
<tr>
<td>Loads carried on one Bearing Piece Per Car, located at or near center of Car</td>
<td>15, A, F</td>
</tr>
<tr>
<td>Loads Carried on one Bearing Piece Per Car, located Between Center of Car and Centre of Truck</td>
<td>15, B, F</td>
</tr>
<tr>
<td>Loads Carried on one Bearing Piece Per Car, located at or near Center of Truck</td>
<td>15, C, F</td>
</tr>
<tr>
<td>Location of Bearing Pieces with Relation to Truck Bolster</td>
<td>23</td>
</tr>
<tr>
<td>Loads Carried on Tops of Sides of Gondola Cars</td>
<td>15, C, G</td>
</tr>
<tr>
<td>Flexible Plates—Twin or Triple Loads</td>
<td>15, B</td>
</tr>
<tr>
<td>Short Material on Floor of Car Loads on one Bearing Piece of Steel Cars, and Cars having Steel Underframes</td>
<td>15, D</td>
</tr>
<tr>
<td>Maximum Weights for Loads on FM, GR, and GRA Cars</td>
<td>15, F</td>
</tr>
<tr>
<td>Maximum Weights for Loads Where Difficult to Ascertain Whether General Instructions Given in Paragraphs 8 and 15 are Complied With</td>
<td>31</td>
</tr>
<tr>
<td>Loads Too Long for Single Cars</td>
<td>16, 31</td>
</tr>
<tr>
<td>Bearing Pieces</td>
<td>12, 22, 23, 24</td>
</tr>
<tr>
<td>Bearing Pieces—Least Allowable Size</td>
<td>29</td>
</tr>
<tr>
<td>Blocking Cars Apart</td>
<td>26, 28</td>
</tr>
<tr>
<td>Carrying Cars—Capacity of</td>
<td>19</td>
</tr>
<tr>
<td>Clearance Between Lading and Floor of Car</td>
<td>17</td>
</tr>
<tr>
<td>Chaining of Cars</td>
<td>27</td>
</tr>
<tr>
<td>Inspection of Cars</td>
<td>28, 30</td>
</tr>
<tr>
<td>Width of Lading</td>
<td>25</td>
</tr>
<tr>
<td>Location of Bearing Pieces with Relation to Truck Bolster</td>
<td>23</td>
</tr>
</tbody>
</table>
Distance Between Bearing
Pieces
Determining Capacity of Car in Tandem Loads
Loads Requiring Flat Cars
Weight on Carrying Cars where Material is Less than 90 Feet Long
Lumber on Open Cars
Lumber on Single Cars
Stakes—Minimum Sizes and Substitutes
Stakes—Number and Size of
Stakes—Tying Together at Top
Lumber in Two Piles Per Car When Length Will Permit
Long Lumber on Top of Two Single Loads
Bearing Pieces—Size of
Maximum Weight of Lading
Stakes—Spacing and Wiring of
Long Lumber on Single Cars Overhanging Idler
Bearing Pieces
Idler—Flat Car
Idler—Gondola Car
Lading Overhanging Idler
Load—On Idler
Load—On one Truck
Stakes—Location of
Long Lumber on Two or Three Cars
Bearing Pieces—Size and Location of
Filling Pieces for Narrow Lading
Stakes—Wiring and Spacing of
Long Lumber on Gondola Cars
Bearing Pieces
Stakes—Location and Wiring of

Rule.  Page.
24  11
19  10
20  10
31  15
32, 33, 34, 52  17, 32
32, 33, 34  17
31, D 20, 21, 22, 23, 24
34  17, 19
34  17, 19
32  17
35, 37  24, 25
35  24
37  25
35, 36  24
38, 46  25, 28
41, 42  25, 28
39  25
40  25
43  28
44  28
46  28
45  28
47, 50  29
49  29
50  29
48  29
51, 52  29, 32
51, 52  29, 32
51, 52  29, 32
<table>
<thead>
<tr>
<th>Item</th>
<th>Rule.</th>
<th>Page.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stanchions—Size and Wiring of</td>
<td>51</td>
<td>29, 32</td>
</tr>
<tr>
<td>Dressed Lumber</td>
<td>53</td>
<td>32</td>
</tr>
<tr>
<td>Single Loads of Sawed Lumber</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Logs, Telegraph Poles, Piling, and Props on Open Cars</td>
<td>54, 59</td>
<td>36, 40</td>
</tr>
<tr>
<td>Bearing Pieces—Sizes</td>
<td>54</td>
<td>36</td>
</tr>
<tr>
<td>Logs</td>
<td>55</td>
<td>36</td>
</tr>
<tr>
<td>Stakes—Number and Size</td>
<td>55</td>
<td>36</td>
</tr>
<tr>
<td>Logs, Piling, Props and Telegraph Poles</td>
<td>56, 59</td>
<td>38, 40</td>
</tr>
<tr>
<td>Bearing Pieces</td>
<td>57</td>
<td>38</td>
</tr>
<tr>
<td>Loads on Two or More Cars</td>
<td>59</td>
<td>40</td>
</tr>
<tr>
<td>Stakes—Kind and Wiring of</td>
<td>56, 57, 58</td>
<td>38, 40</td>
</tr>
<tr>
<td>Tan Bark, Laths, Slab Wood, Etc.</td>
<td>60, 66, 66, A</td>
<td>40, 43, 44</td>
</tr>
<tr>
<td>Tan Bark on Flat Cars</td>
<td>60</td>
<td>40</td>
</tr>
<tr>
<td>Ladder at End of Car</td>
<td>60</td>
<td>40</td>
</tr>
<tr>
<td>Stakes—Wiring of</td>
<td>60</td>
<td>40</td>
</tr>
<tr>
<td>Tan Bark on Gondola Cars</td>
<td>61, 65</td>
<td>41, 44</td>
</tr>
<tr>
<td>Height of Lading</td>
<td>63, 64</td>
<td>44</td>
</tr>
<tr>
<td>Stakes—Wiring and Securing of</td>
<td>61, 63</td>
<td>41, 41</td>
</tr>
<tr>
<td>Loads on Gondola Cars—Height of Sides</td>
<td>63, 64</td>
<td>44</td>
</tr>
<tr>
<td>Ties, Fence Posts, Etc., on Open Cars</td>
<td>67, 69</td>
<td>47</td>
</tr>
<tr>
<td>Height of Loads—Securing in Gondola Cars</td>
<td>68, 69, 70</td>
<td>47</td>
</tr>
<tr>
<td>Ties and Fence Posts on Flat Cars</td>
<td>67</td>
<td>47</td>
</tr>
<tr>
<td>Sapling—Securing Loads</td>
<td>71</td>
<td>47</td>
</tr>
<tr>
<td>Structural Material, Plates, Rails, Girders, Etc.</td>
<td>72, 104</td>
<td>49, 91</td>
</tr>
<tr>
<td>Loads on Single Cars</td>
<td>72, 75</td>
<td>49, 53</td>
</tr>
<tr>
<td>Girders Clamped Together</td>
<td>72</td>
<td>49</td>
</tr>
<tr>
<td>Long Girders Loaded Flatwise</td>
<td>72</td>
<td>49</td>
</tr>
<tr>
<td>Loading of Large Overhanging Girders</td>
<td>73</td>
<td>53</td>
</tr>
<tr>
<td>Open Girdens and Half Roof Trusses</td>
<td>75</td>
<td>53</td>
</tr>
<tr>
<td>Description</td>
<td>Rule</td>
<td>Page</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------------</td>
<td>------</td>
<td>-------</td>
</tr>
<tr>
<td>Deep Girders Loaded Vertically</td>
<td>75</td>
<td>53</td>
</tr>
<tr>
<td>Short Material on Single Gondola Cars</td>
<td>74</td>
<td>53</td>
</tr>
<tr>
<td>Loads In Gondola Cars Overhanging</td>
<td>76, 84</td>
<td>58, 66</td>
</tr>
<tr>
<td>Bearing Pieces—Size of</td>
<td>76, 81</td>
<td>58, 61</td>
</tr>
<tr>
<td>Depth of Load</td>
<td>78</td>
<td>61</td>
</tr>
<tr>
<td>Flexible Material Overhanging</td>
<td>80, 82</td>
<td>61</td>
</tr>
<tr>
<td>Bearing Pieces Not Required—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flexible Material</td>
<td>80</td>
<td>61</td>
</tr>
<tr>
<td>End Blocking</td>
<td>80, 82</td>
<td>61</td>
</tr>
<tr>
<td>Idler—Flat Car</td>
<td>83</td>
<td>61, 66</td>
</tr>
<tr>
<td>Idler—Gondola Car</td>
<td>84</td>
<td>66</td>
</tr>
<tr>
<td>Securing Overhanging Loads</td>
<td>77</td>
<td>58</td>
</tr>
<tr>
<td>Weights for which End Blocking is not Required</td>
<td>79</td>
<td>61</td>
</tr>
<tr>
<td>Structural Material on Single Cars Overhanging, Both Ends</td>
<td>85, 87</td>
<td>66</td>
</tr>
<tr>
<td>Bearing Pieces</td>
<td>86</td>
<td>66</td>
</tr>
<tr>
<td>Securing Overhanging Ends—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Braces on Tie Rods</td>
<td>87</td>
<td>66</td>
</tr>
<tr>
<td>Flexible Plates on Single Cars...</td>
<td>88</td>
<td>66</td>
</tr>
<tr>
<td>Bearing Pieces Not Required...</td>
<td>89</td>
<td>69</td>
</tr>
<tr>
<td>Twin Loads</td>
<td>90, 104</td>
<td>69, 91</td>
</tr>
<tr>
<td>Bearing Pieces—Gondola Cars with Drop Ends, or Flat Cars</td>
<td>90</td>
<td>69</td>
</tr>
<tr>
<td>Bearing Pieces—Gondola Cars Without Drop Ends</td>
<td>92, 94</td>
<td>71</td>
</tr>
<tr>
<td>Braces for Long Girders—List of Material</td>
<td>104</td>
<td>90</td>
</tr>
<tr>
<td>Braces for Long Girders—Notes</td>
<td>104</td>
<td>91, 92</td>
</tr>
<tr>
<td>Girders More Than 70 Feet</td>
<td>104, F</td>
<td>91</td>
</tr>
<tr>
<td>Long, Oblong Holes for Bolster Pins</td>
<td>104, G</td>
<td>91</td>
</tr>
<tr>
<td>Girders, 8 Feet Deep, less than 30,000 pounds, Bolster Equipment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Description</td>
<td>Rule.</td>
<td>Page.</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>Girders More Than 50 Feet Long, if to go Around Curves</td>
<td></td>
<td></td>
</tr>
<tr>
<td>More Than 20 Degrees</td>
<td>104, H</td>
<td>91</td>
</tr>
<tr>
<td>Built Up Bolsters</td>
<td>104, D, 104, I, 104, K</td>
<td>91, 92</td>
</tr>
<tr>
<td>Clearance Between Loads and Sides of Car</td>
<td></td>
<td>69</td>
</tr>
<tr>
<td>Lading on Two Bearing Pieces and Two Sliding Pieces—Clearance</td>
<td></td>
<td>77</td>
</tr>
<tr>
<td>Lading on One Bearing Piece and Two or More Sliding Pieces, Per Car</td>
<td></td>
<td>77</td>
</tr>
<tr>
<td>Long Flexible Material</td>
<td></td>
<td>71</td>
</tr>
<tr>
<td>Location of Diagonal Brace Rods</td>
<td>104, B</td>
<td>91</td>
</tr>
<tr>
<td>Size of Temporary Bolts in Flange of Girders</td>
<td>104, C</td>
<td>91</td>
</tr>
<tr>
<td>Filling Pieces Between Stringers</td>
<td>104, E</td>
<td>91</td>
</tr>
<tr>
<td>Short Material Loaded on Floor of Car</td>
<td></td>
<td>77</td>
</tr>
<tr>
<td>Structural Material Over 60 Feet Long</td>
<td></td>
<td>84</td>
</tr>
<tr>
<td>Turntables</td>
<td>105, 111</td>
<td>92, 94</td>
</tr>
<tr>
<td>Turntables on Pivoted Bolsters</td>
<td>100, 110, 111</td>
<td>94</td>
</tr>
<tr>
<td>Cribbing for Turntables—Sizes</td>
<td>106, 107, 108</td>
<td>92, 94</td>
</tr>
<tr>
<td>Rolled Material of Small Sectional Area</td>
<td>98, 102</td>
<td>77, 84</td>
</tr>
<tr>
<td>Bearing or Sliding Pieces—Sizes</td>
<td></td>
<td>81</td>
</tr>
<tr>
<td>Loads on Two or More Cars</td>
<td>101</td>
<td>81</td>
</tr>
<tr>
<td>Rolled Material, Etc., in Single Gondola Cars</td>
<td>98</td>
<td>77</td>
</tr>
<tr>
<td>Pig Iron, Short Billets, Etc., in Hopper Cars</td>
<td>98, A</td>
<td>77</td>
</tr>
<tr>
<td>Rolled Material, Etc., in Single Flat Cars</td>
<td>99</td>
<td>81</td>
</tr>
<tr>
<td>Pipe on Open Cars</td>
<td>112, 117</td>
<td>99, 102</td>
</tr>
<tr>
<td>Pipe 12 Inches or Less in Diameter</td>
<td>112</td>
<td>99</td>
</tr>
<tr>
<td>Description</td>
<td>Rule</td>
<td>Page</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>Pipe More Than 12 Inches in Diameter, Less Than 24 Inches In Diameter</td>
<td>113</td>
<td>99</td>
</tr>
<tr>
<td>Pipe 24 Inches in Diameter and Over</td>
<td>115</td>
<td>101</td>
</tr>
<tr>
<td>Blocking for Pipe 3 Feet in Diameter or Over</td>
<td>116</td>
<td>102</td>
</tr>
<tr>
<td>Stakes—Wiring for Pipe 18 Feet or Less In Length</td>
<td>114</td>
<td>101</td>
</tr>
<tr>
<td>Stakes—Number of</td>
<td>114, 117</td>
<td>101, 102</td>
</tr>
<tr>
<td>Stone on Open Cars</td>
<td>118, 119</td>
<td>102</td>
</tr>
<tr>
<td>Flagging, etc., on Straight Face</td>
<td>118, 123</td>
<td>102, 103</td>
</tr>
<tr>
<td>Flagging, etc., on Uneven Face</td>
<td>120</td>
<td>102</td>
</tr>
<tr>
<td>Stone Not Safe on Flat Cars</td>
<td>119</td>
<td>102</td>
</tr>
<tr>
<td>Brick, Sewer Pipe, etc., in Gondola Cars</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Note</td>
<td></td>
<td>103</td>
</tr>
<tr>
<td>Grindstones on Gondola Cars</td>
<td>121</td>
<td>103</td>
</tr>
<tr>
<td>Height of Load Above Car Sides</td>
<td>122</td>
<td>103</td>
</tr>
<tr>
<td>Dressed Stone Loaded in Tiers on Flat Cars</td>
<td>124</td>
<td>105</td>
</tr>
<tr>
<td>End Stakes</td>
<td>125</td>
<td>105</td>
</tr>
<tr>
<td>Grindstones Loaded on Flat Cars</td>
<td>126</td>
<td>105</td>
</tr>
<tr>
<td>Loading Boiler Shelves 8 Feet or Over In Diameter</td>
<td>127</td>
<td>107</td>
</tr>
<tr>
<td>Material Loaded in Closed Cars</td>
<td>120</td>
<td>107</td>
</tr>
<tr>
<td>Door Protection</td>
<td>128</td>
<td>107</td>
</tr>
<tr>
<td>Ties, Etc.</td>
<td>129</td>
<td>107</td>
</tr>
<tr>
<td>Cars Not Acceptable</td>
<td>130</td>
<td>107</td>
</tr>
<tr>
<td>Cars Without Doors</td>
<td>130</td>
<td>107</td>
</tr>
<tr>
<td>Loading of Tires</td>
<td>131</td>
<td>110</td>
</tr>
<tr>
<td>Loading of Wheels</td>
<td>132</td>
<td>110</td>
</tr>
<tr>
<td>Loading of Scrap Junk</td>
<td>133</td>
<td>110</td>
</tr>
<tr>
<td>Loading of Sewer Pipe, Drain Tile, Etc.</td>
<td>134</td>
<td>110</td>
</tr>
</tbody>
</table>