June 1, 1965 S. H. FILLION 3,186,357

RAILWAY CARS FOR TRANSPORTING CYLINDRICAL OBJECTS

Filed Sept. 11, 1962 5 Sheets-Sheet 1

FIG. 1a

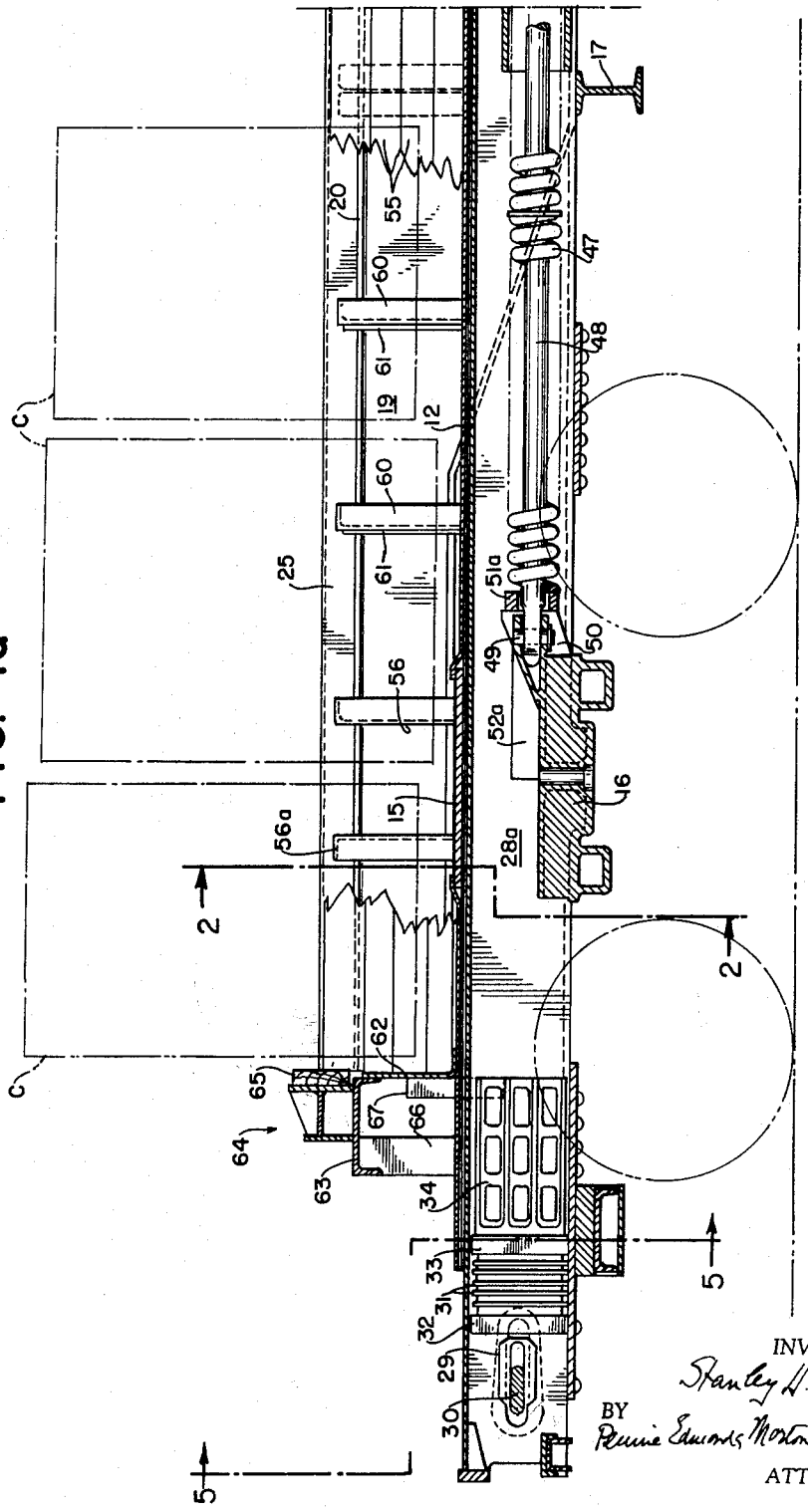

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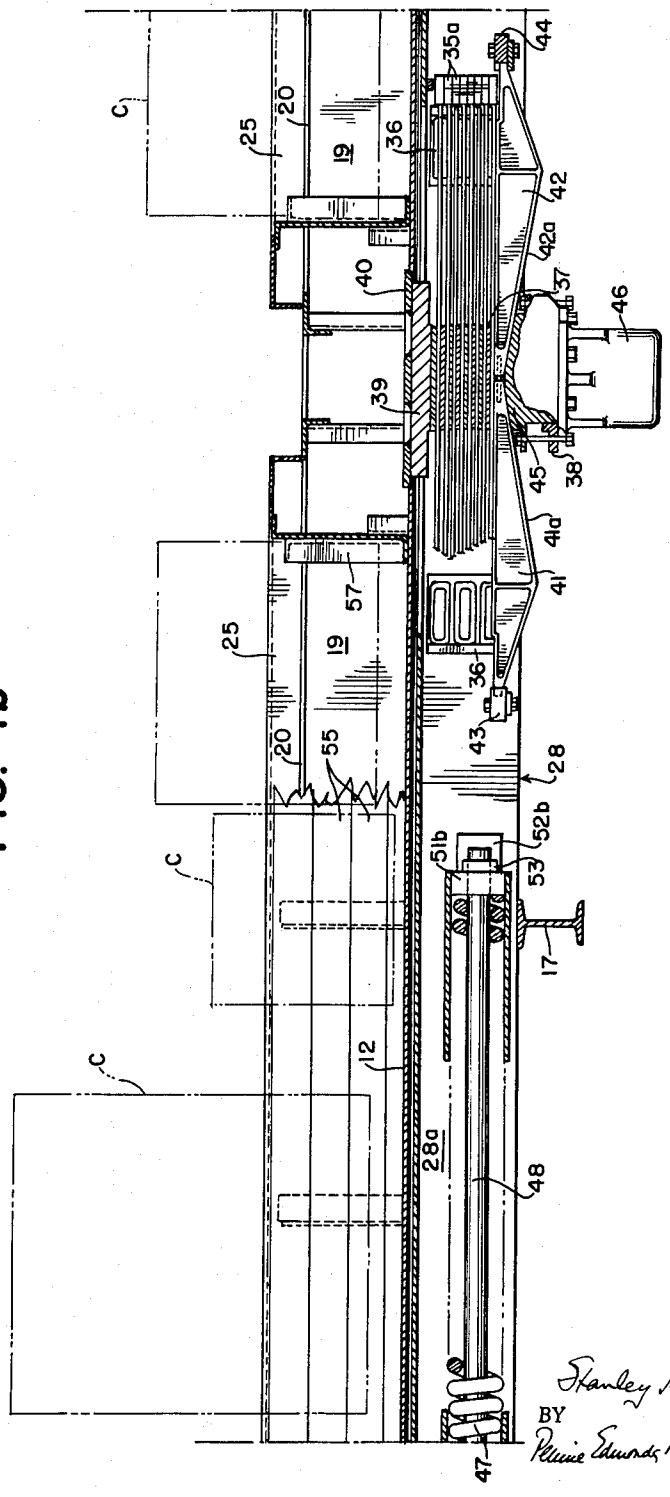
FIG. 1b



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RAILWAY CARS FOR TRANSPORTING CYLINDRICAL OBJECTS

Filed Sept. 11, 1962 5 Sheets-Sheet 3

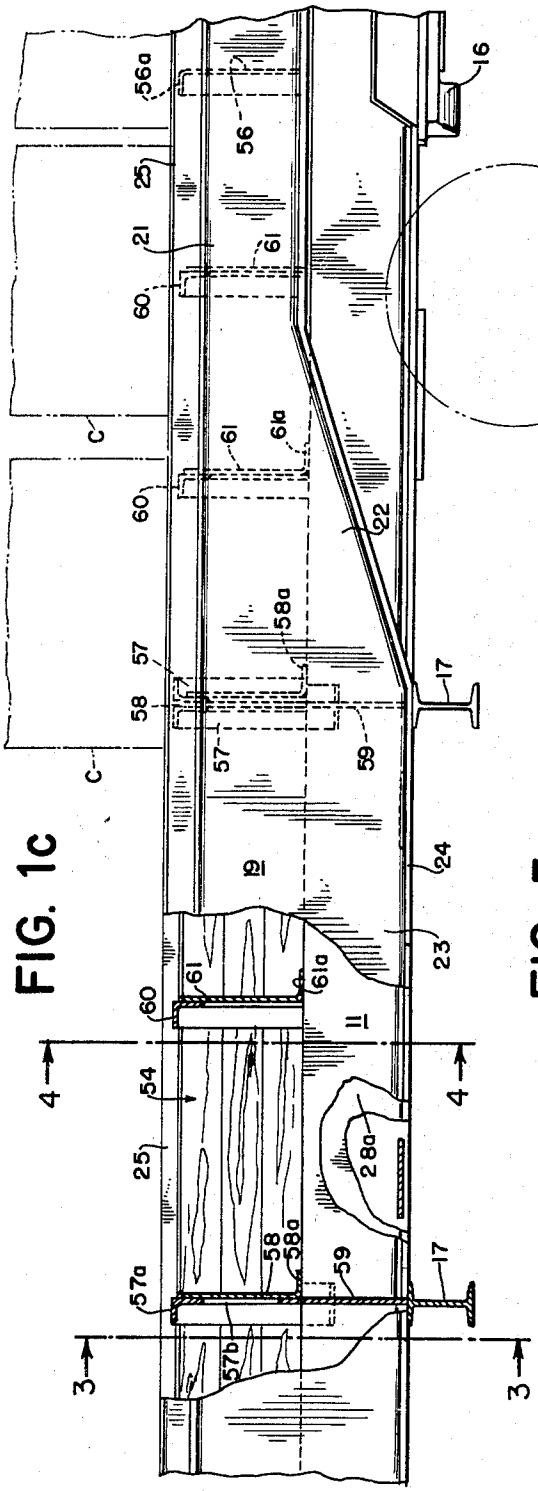

FIG. 1c

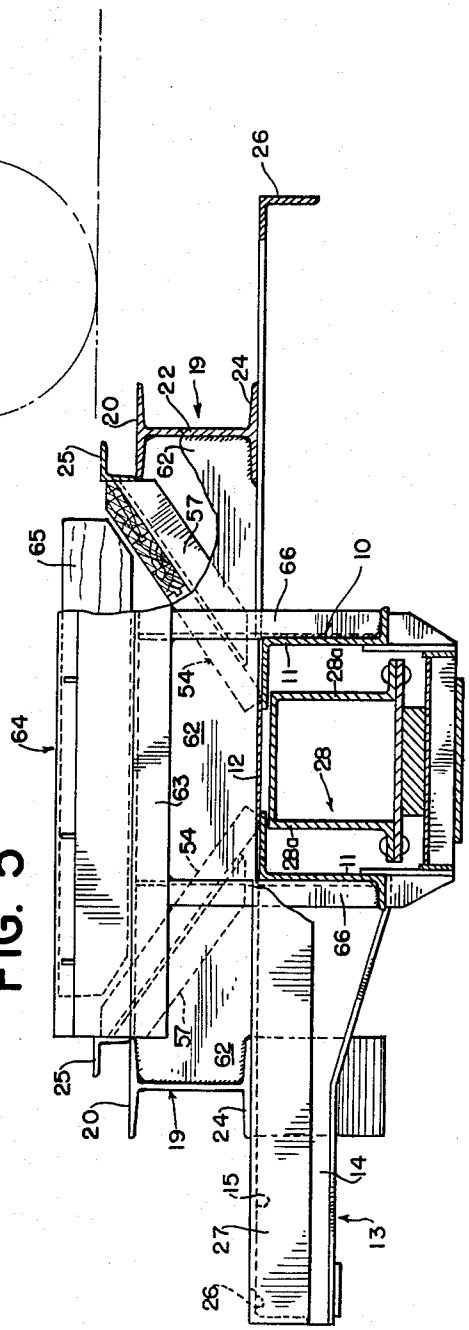

FIG. 5

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RAILWAY CARS FOR TRANSPORTING CYLINDRICAL OBJECTS

Filed Sept. 11, 1962 5 Sheets-Sheet 4

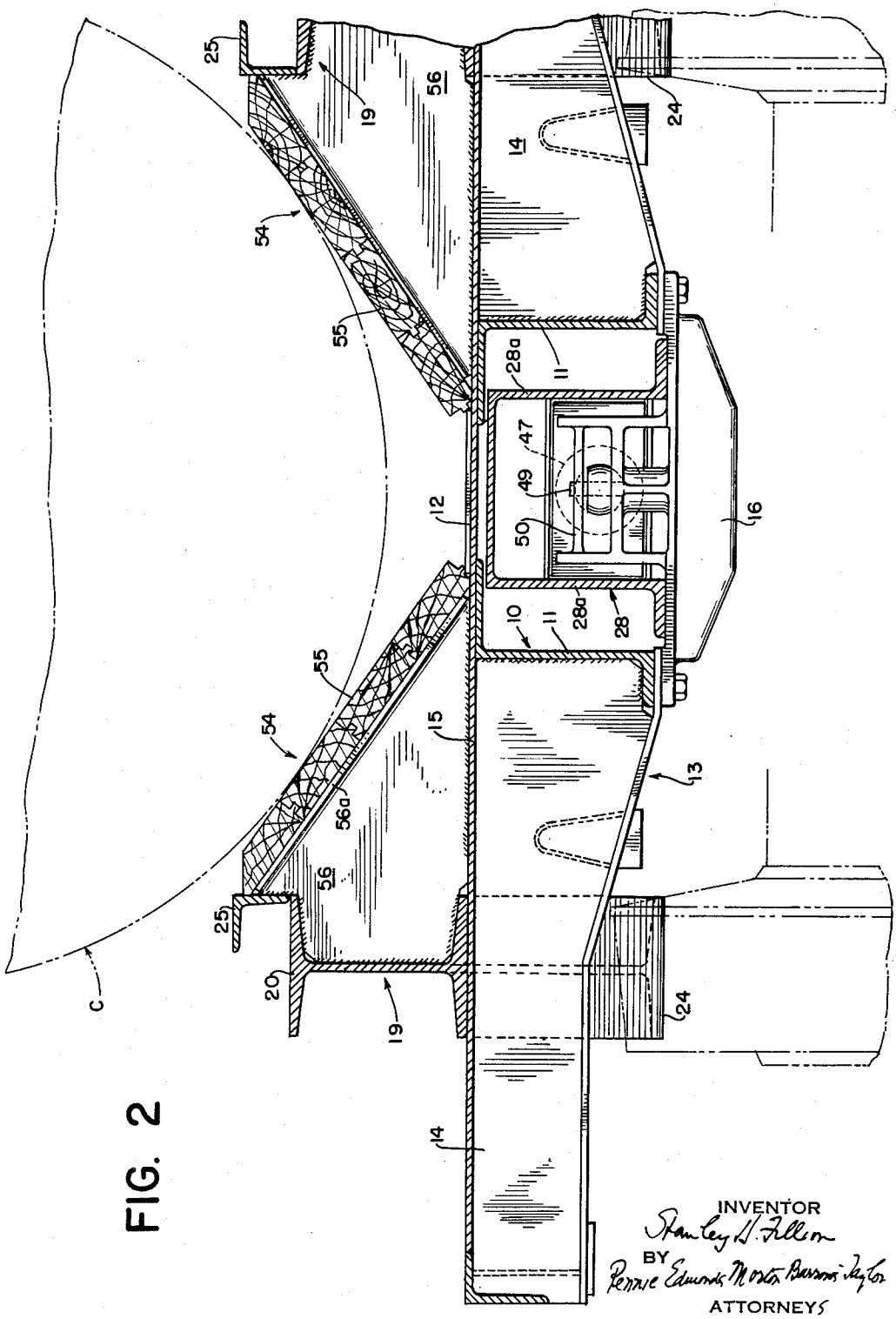

FIG. 2

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RAILWAY CARS FOR TRANSPORTING CYLINDRICAL OBJECTS

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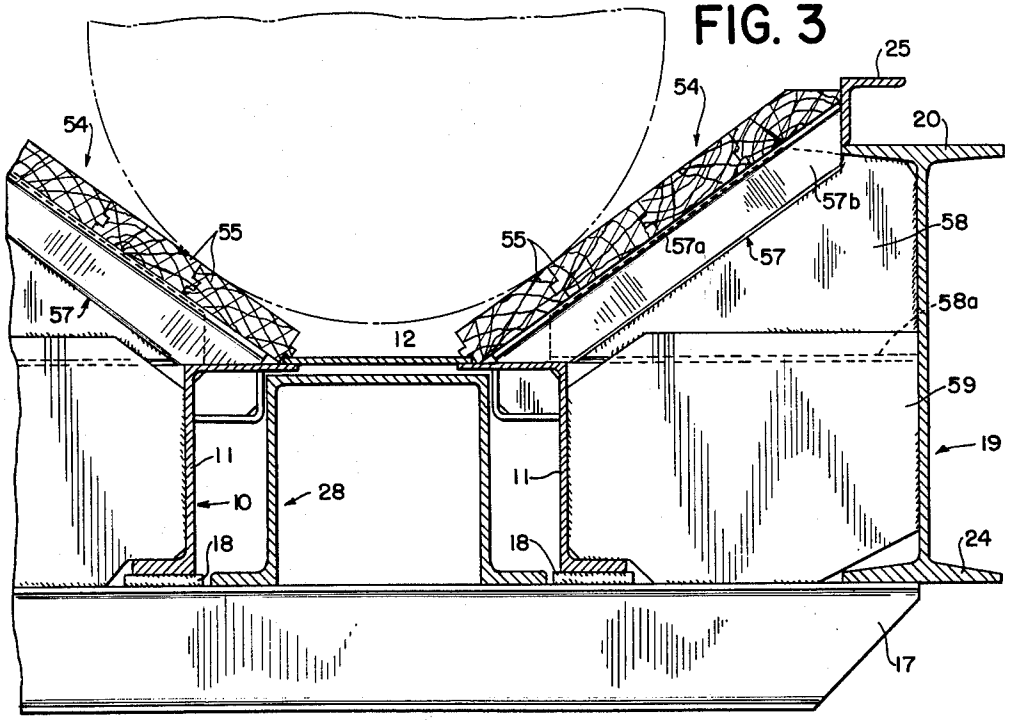
FIG. 3



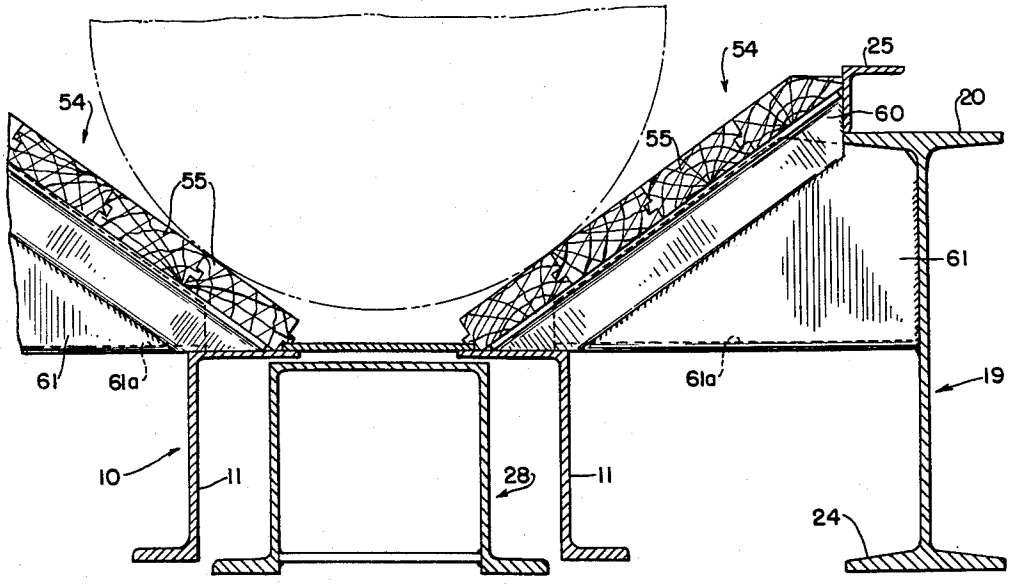


FIG. 4

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RAILWAY CARS FOR TRANSPORTING CYLINDRICAL OBJECTS

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Filed Sept. 11, 1962, Ser. No. 222,914
8 Claims. (Cl. 105—367)

This invention relates to railway cars and is concerned more particularly with a novel railway car, on which heavy objects of cylindrical shape may be transported without damage and without the use of expensive blocking material. The new car may be profitably used in the carriage of tanks, coils of metal strip, and other objects of similar shape, and, since all the advantages of the car are realized in its use for transporting coils of metal strip, a form of the car primarily for such use will be illustrated and described in detail for purposes of illustration.

Coils of wide steel strip, such as are used in the manufacture of automobile bodies, are of great weight and their transporation without damage has heretofore presented difficult problems. In some instances, they have been mounted on skids of the pallet type and shipped in insulated box cars, in which the skids are anchored in place by means of expensive blocking material. Powerful lift trucks are then required to load the skids in the cars and remove them. As an alternative, the coils have been placed in cradles attached to skids and the skids have been loaded on cars of the gondola type, provided with resilient end buffers intended to cushion the movement of the skids. While this arrangement avoids the necessity of providing costly blocking, the weight of the loaded skids is so great that the springs of the buffers are frequently damaged by movement of the skids on the car floor.

The present invention is, accordingly, directed to the provision of a railway car for the carriage of coils of metal strip and like heavy cylindrical objects, which transports the coils without damage and in a position facilitating their loading and unloading and does not require the use of expensive blocking material. The new car is provided with an underframe which includes a hollow longitudinal center sill, bolsters, and major side sills resting on the bolsters inward from their ends and extending above the level of the top of the center sill. The coils are carried in a cradle, which rests upon the center sill and is supported by members attached to the side and center sills. A movable draft and buffing column is mounted within the center sill and its movements relative to the center sill are resisted by a long travel cushioning mechanism. With the construction described, the coils are carried in a cradle, which is an integral part of the car structure, and shocks in buff and draft applied to the couplers are absorbed by the cushioning mechanism. As a result, the coils are transported without damage and only light cross-bars are used on the cradle to separate the coils.

For a better understanding of the invention, reference may be made to the accompanying drawings, in which

FIGS. 1*a*, 1*b*, and 1*c* form a fragmentary longitudinal vertical sectional view of a car embodying the invention;

FIG. 2 is a transverse sectional view on the line 2—2 of FIG. 1*a*;

FIGS. 3 and 4 are transverse sectional views on lines 3—3 and 4—4 of FIG. 1*c*; and

FIG. 5 is a transverse sectional view on the line 5—5 of FIG. 1*a*.

The railway car shown in the drawings has an underframe which includes a hollow longitudinal center sill **10** formed of a pair of Z-bars **11** disposed with their upper

flanges opposed and spaced and a cover plate **12** closing the space between the edges of the flanges. Near the ends of the car and overlying the trucks are bolsters **13** comprising the usual box sections **14** extending outwardly from the center sill, the sections having a common cover plate **15**, which extends across the sill between spaced sections of the cover plate **12**. The sections **14** of each bolster are connected by a center casting **16** which extends across the open bottom of the center sill and, at intervals between the bolsters, I-beams **17**, which are parts of crossbearers, extend across the bottom of the center sill and are attached to pads **18** secured to the lower flanges of the center sill. A major side sill **19** of I-beam form is mounted on and secured to the tops of the bolsters **13** inward from their ends at each side of the center sill. The major side sills extend substantially from one end of the car to the other and their top flanges **20** lie in a common plane lying substantially above the level of the top of the center sill **10**. The sills **19** have relatively narrow end sections **21** overlying the bolsters and, inward from the end sections, each sill has connecting sections **22** increasing in width to a middle section **23**, the lower flange **24** of which rests upon and is secured to the tops of the beams **17**. An angle bar **25** is attached to the top of each major side sill along its inner edge with one flange of the bar extending vertically and the other horizontally outward to overlie the sill. Minor side sills **26** extend outwardly from the ends of the bolsters to the ends of the car and are connected by an end sill **27**.

A draft and buffing column **28**, which is formed of a pair of Z-bars **28***a* having their top flanges opposed and secured together, extends through the center sill from end to end and is supported on the center castings **16** and the beams **17**. At its ends, the column is provided with key slots having reinforcements **29** and a key **30** in each slot connects the shank of a coupler to the column. Inward from each key slot, the column encloses a cushioning unit made up of a plurality of rubber springs **31** lying between follower plates **32**, **33**. The front follower plate **32** is engaged by the shank of the adjacent coupler and the rear follower plate **33** abuts a pair of draft lugs **34** secured within the column to the opposed vertical surfaces thereof.

The endwise movements of the column relative to the center sill are resisted by a long travel cushioning mechanism which may be of various types and has a travel of at least 10″ and, preferably, of about 20″. The mechanism shown is of the construction disclosed in MacCurdy Patent 2,911,113, issued November 3, 1959, and it includes a stack of movable friction plates **35** extending lengthwise of the column and having enlarged ends **35***a* with lateral extensions engaged on their inner sides by stop lugs **36** secured in pairs at opposite ends of the stack of plates to the inner opposed surfaces of the column. Stationary friction plates **37** extending transversely are interleaved with the plates **35** and are secured within a yoke forming part of a friction box **38**. The top **39** of the yoke extends through an opening in the top of the column and is attached to a plate **40** secured to the top flanges of the center sill. The bottom plate of the stack of movable plates **35** rests upon a pair of aligned plates **41**, **42** having oppositely inclined plane bottom surfaces **41***a*, **42***a*, respectively. The plates are mounted between stop bars **43**, **44** secured to the opposed inner faces of the column and the surfaces **41***a*, **42***a* of the inclined plane plates engage the top of a piston **45**, which extends into a dashpot cylinder **46** attached to the friction box **38**. Upon movement of the column relative to the sill in either direction from the central position of the column, one or the other of the inclined plane plates **41**, **42** causes a downward movement of the piston

into the cylinder and, at the same time, the friction plates are squeezed or compressed together.

The cushioning mechanism includes a restoring spring 47 enclosing a link 48 attached at one end by a pin 49 to a projection 50 on one of the center castings 16. The link passes through follower plates 51*a*, 51*b* at the ends of the spring and engaging stop plates 52*a*, 52*b* on the opposed faces of the column and has a collar 53 fast thereon and bearing against the outer face of the follower plate 51*b*. With this arrangement, the movement of the column relative to the sill in either direction causes compression of the spring 48 and the spring acts to restore the column to its central position after release of the force which caused the column movement.

A cradle of trough shape is formed as an integral part of the car structure and the cradle includes a pair of downwardly convergent floor sections 54 extending lengthwise of the car and each usually including a number of planks 55 lying in a plane and having tongue and groove connections. The floor sections extend from the tops of respective major side sills to the top flanges of the bars 11 of the center sill 10 and the cover plates 15 of the bolsters. The sections are supported by supporting members disposed at intervals lengthwise of the car with some of the members lying above the bolsters, others forming parts of crossbearers, and the remainder out of vertical alignment with both the bolsters and crossbearers.

At the bolsters, the supporting members for the floor sections are diaphragm plates 56 which are secured by welding to the top and bottom flanges and the webs of the major side sills 19, the angle vertical flanges of the bars 25, and the cover plates 15 of the bolsters. The diaphragm plates have inclined top edges with lateral flanges 56*a* serving as parts of the respective floor sections. By securing the plates 56 rigidly to the sills 19, the angle bars 25, and the bolsters, the plates not only support the floor sections 54 but also provide rigid connections between the center and side sills.

The floor section supporting members forming parts of crossbearers include angle bars 57 resting on and rigidly secured to the top flanges of the Z-bars 11 of the center sill 10 and in contact with and rigidly secured to the vertical flanges of the angle bars 25 and the inner edges of the top flanges 20 of the major side sills 19. One flange 57*a* of each angle bar 57 serves as part of a floor section 54 and the other flange 57*b* is vertical and overlaps and is secured to an upper diaphragm plate 58 having a lateral bottom flange 58*a* resting upon the top flange of the adjacent Z-bar of the center sill. The edges of the plate 58 are in contact with and secured by welding to the web and top flange of the adjacent major side sill 19. The supporting member is completed by a diaphragm plate 59 which overlaps the lower edge of the plate 58 and is secured thereto by welding. The plate 59 is also welded along its edges to the webs of the adjacent Z-bar 11 and major side sill 19 and to the top of an I-beam 17. The supporting members at the ends of the middle sections 23 of the major side sills preferably include two angle bars 57 placed with their vertical flanges parallel and the diaphragm plate 58 lying between them. The rigid assembly of one or two pairs of angle bars 57, a pair of upper diaphragm plates 58, a pair of lower diaphragm plates 59, and an I-beam 17, together with the adjacent parts of the center sill bars 11, acts as a crossbearer extending between the major side sills and supporting the movable column 28 and also acts as a supporting member for a floor section 54. By securing the diaphragm plates 58, 59 to the center and major side sills an unusually strong construction is provided.

The floor sections 54 are further supported between the bolsters and crossbearers and between adjacent crossbearers by supporting members which comprise angle bars 60 resting on and secured to the top flanges of the Z-bars 11 and in contact with and secured to the angle bars 25 attached to the top flanges of the adjacent major side sills. The angle bars 60 have lateral flanges serving as parts of respective floor sections and vertical flanges secured by welding to diaphragm plates 61. Each diaphragm plate 61 rests upon the top flange of a Z-bar 11 and has a vertical edge secured to the web of the adjacent major side sill 19. Each plate 61 is provided with a horizontal flange 61*a* to give it additional strength. The combination of an angle bar 60 and a diaphragm plate 61 secured rigidly together and to a Z-bar of the center sill and to the adjacent major side sill not only performs the function of a support for a floor section 54 but also acts as a cross tie.

The ends of the cradle are closed by end walls, each of which includes a plate 62 having a horizontal bottom flange resting on and secured to the top flanges of the Z-bars 11 of the center sill. The upper edge of the plate overlaps and is secured to one flange of an inverted channel member 63, which extends between the vertical flanges of the angle bars 25. A fabricated H-beam 64, on the inner face of which is mounted a plank 65, is mounted on top of the channel member and lies between the floor sections 54. A pair of angle bars 66 are attached to the channel member and extend down and are secured to the outer faces of the webs of the Z-bars 11 and to the lower flanges thereof. The wall is further strengthened by angle bars 67 secured to the outer faces of the plates 62 and to the outer faces of the webs of the bars 11.

In the use of the car in transporting coils C, the coils are placed in the cradle with their axes extending lengthwise of the trough and they are held in place by transverse blocking bars which rest upon the top flanges of the angle bars 25 and are secured in place by pins passing through the blocking bars and into openings in the flanges. The bars required for the purpose are relatively light in weight and they may be easily placed in position and removed. Heavy coils are preferably placed in the trough over the bolsters and it will be noted that the spacing of the members supporting the floor sections of the cradle is smaller near the bolsters than in the middle of the car. After the car is loaded, the coils are protected by a cover of inverted trough form which is placed over them and rests on the top flanges 20 of the major side sills 19. The horizontal flanges of the angle bars 25 act as anchoring means to prevent lateral shifting of the cover and it is secured in place by any suitable means. With the cradle formed as an integral part of the car structure and the coils securely anchored in the cradle, the long travel cushioning mechanism affords good protection to the car and lading. The loading of the coils into the open top cradle and their removal are simple operations which can be easily performed by equipment available for the purpose.

I claim:

1. A railway car for carrying cylindrical objects with their axes lying lengthwise of the car, which comprises an underframe made up of a hollow longitudinal center sill, bolsters connected to the sill near its ends, filler castings connected to the sill to extend across its bottom at the bolsters, a pair of major side sills lying, respectively, on opposite sides of the center sills and resting on the bolsters inward from their ends, the upper ends of the major side sills lying in a common plane substantially above the level of the top of the center sill, and crossbearers each including a beam extending between and secured to the lower ends of the major side sills and extending across and secured to the bottom of the center sill, each crossbearer having parts extending upward from its beam and lying between and secured rigidly to the opposed faces of each major side sill and the center sill, a cradle mounted on the underframe and including a pair of downwardly convergent longitudinal floor sections extending from the tops of respective major side sills to the tops of the center sill and

bolsters, supporting members for the floor sections secured rigidly to the side sills and the center sill, certain of the supporting members acting as cross ties, the upwardly extending parts of the crossbearers having upper end sections engaging and supporting the floor sections, end walls mounted on the center sill at the ends of the floor sections and connecting the side sills, a movable draft and buffing column within the center sill and resting on the filler castings and crossbearers, and long travel cushioning mechanism connected to the center sill and column and resisting the movement of the column relative to the center sills.

2. The railway car of claim **1**, in which the floor section supporting members are disposed lengthwise of the car at intervals with certain of the members lying above the bolsters, and others lying out of vertical alignment with the bolsters.

3. The railway car of claim **2**, in which the supporting members are more closely spaced near the ends of the car than at the middle.

4. The railway car of claim **2**, in which the supporting members above the bolsters are diaphragm plates rigidly secured to the inner faces of adjacent major side sills and to the tops of the bolsters, the diaphragm plates having flanges contacting the respective floor sections.

5. The railway car of claim **2**, in which each supporting member out of vertical alignment with a bolster includes an angle bar rigidly secured to the center sill and the adjacent major side sill and a diaphragm plate rigidly secured to the angle bar and to the center and major side sills.

6. The railway car of claim **1**, in which each floor section includes a plurality of planks connected together in edge contact and lying in a plane.

7. The railway car of claim **1**, in which each side sill includes an I-beam resting on and secured to the bolsters inward from their ends, the beam having a web having narrow end sections above the bolsters, a wide middle section, connecting sections increasing in width from the end sections to the middle section, and a lower flange resting on the bolsters and, where extending along the middle section of the web, lying substantially in the plane of the bottom of the center sill.

8. The railway car of claim **1**, which includes minor side sills attached to the outer ends of the bolsters and extending toward the adjacent ends of the car and end sills attached to the outer ends of the minor side sills.

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