

Aug. 20, 1957

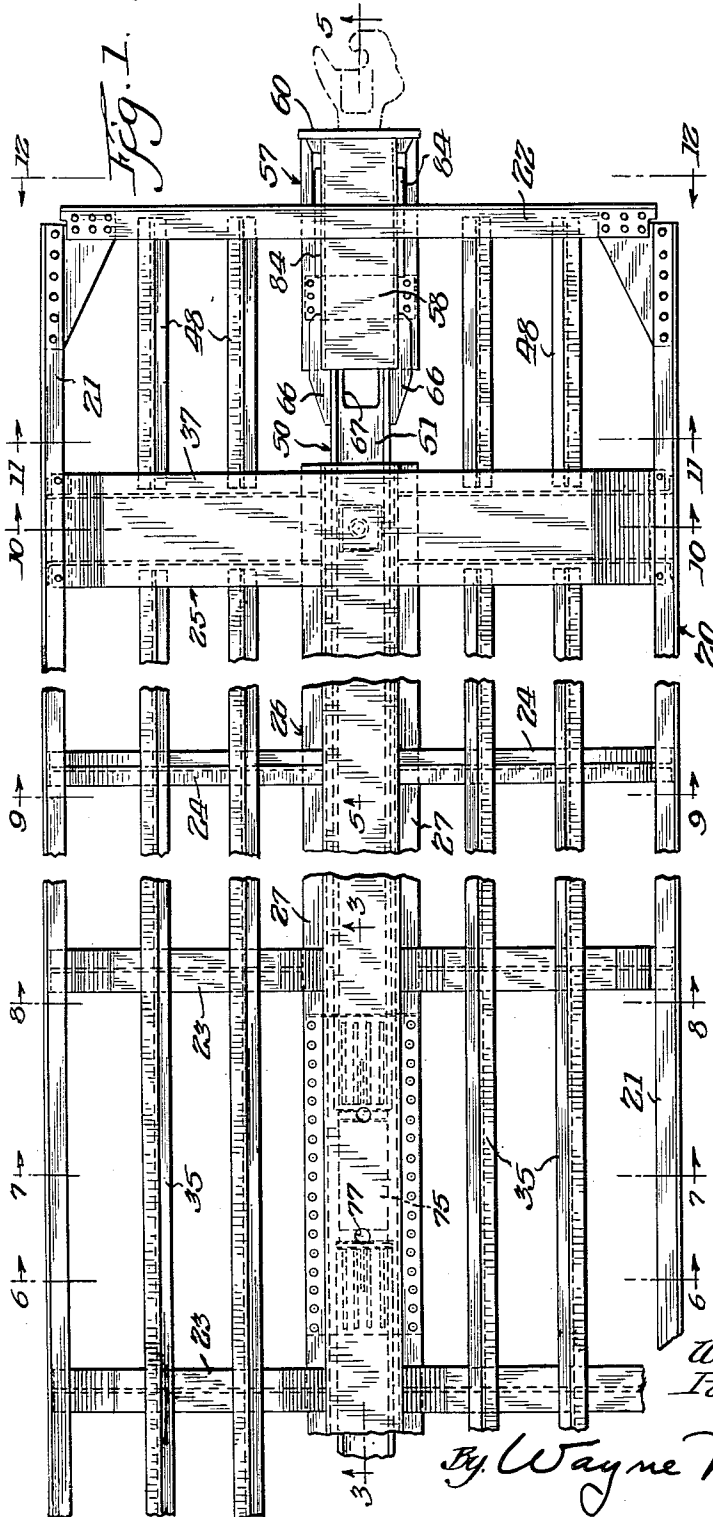
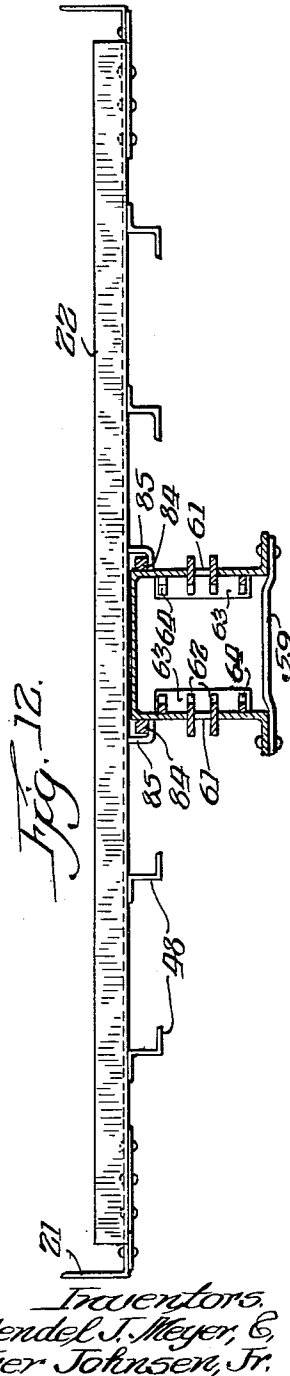
W. J. MEYER ET AL

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Filed May 29, 1952

7 Sheets-Sheet 1



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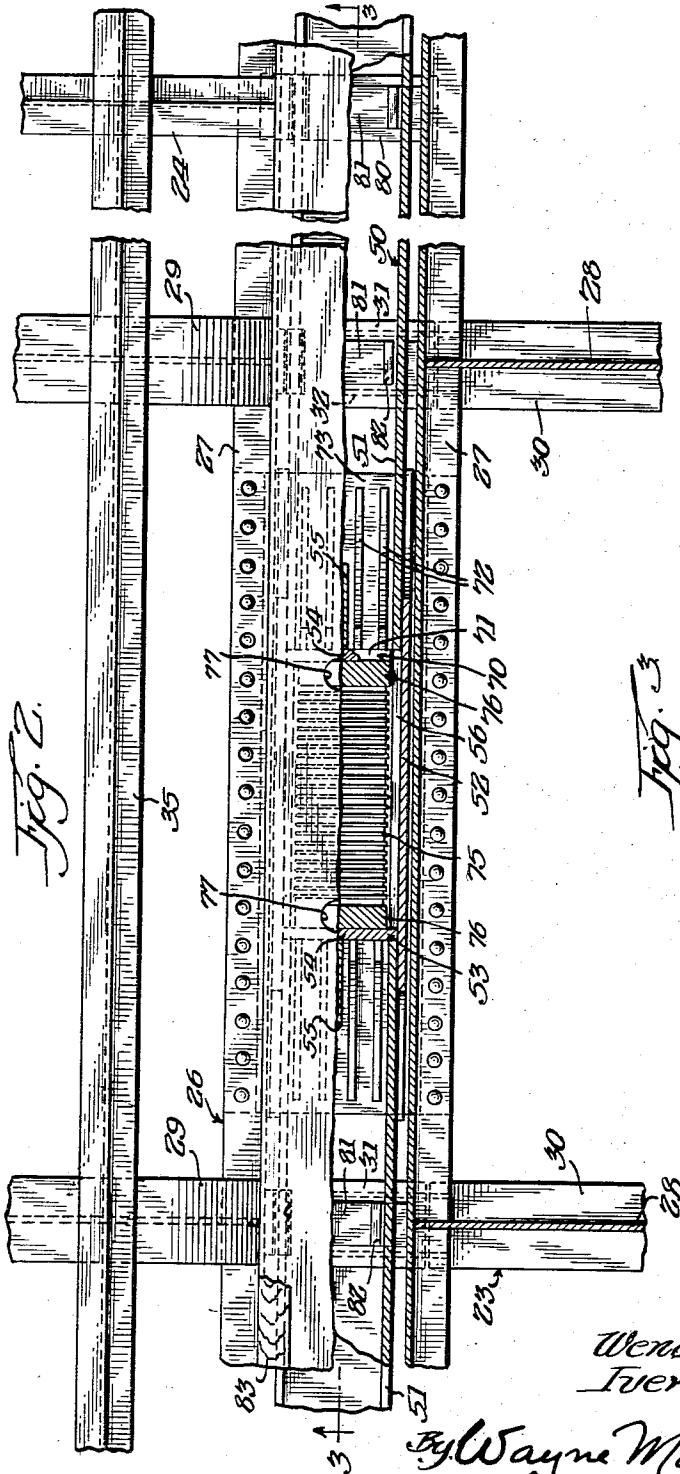
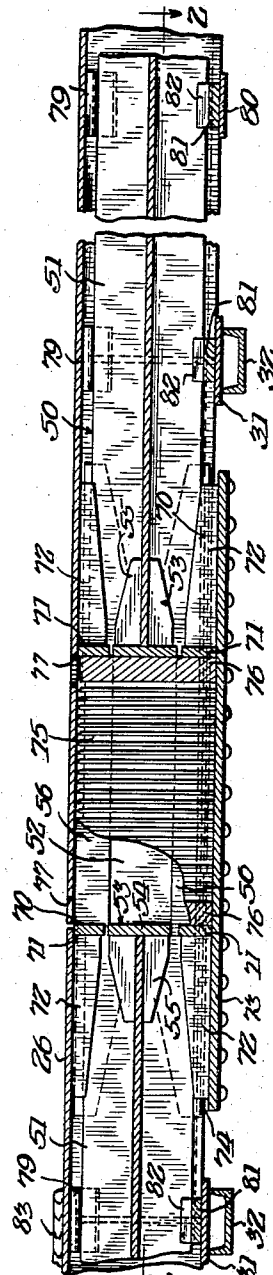
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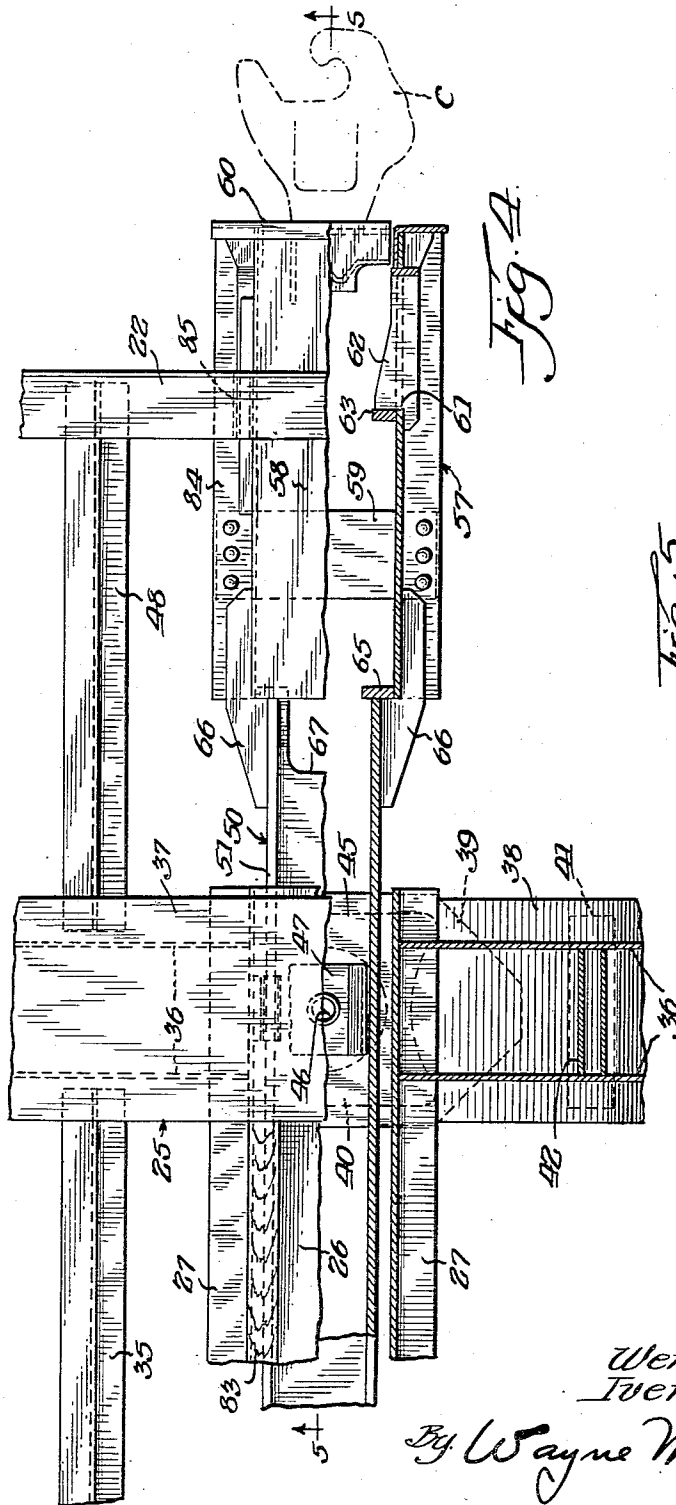
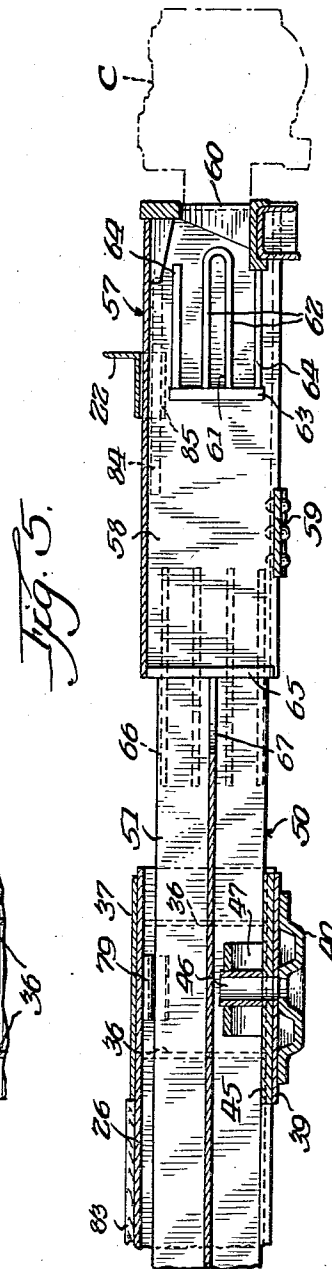
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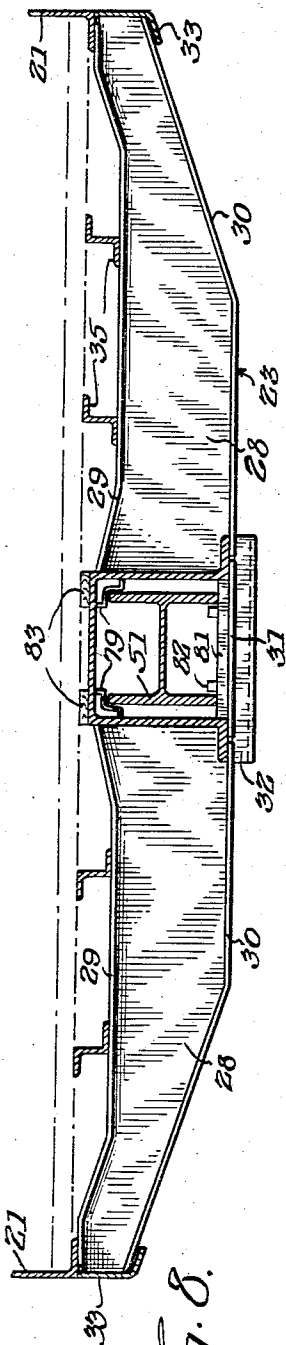


Fig. 8.

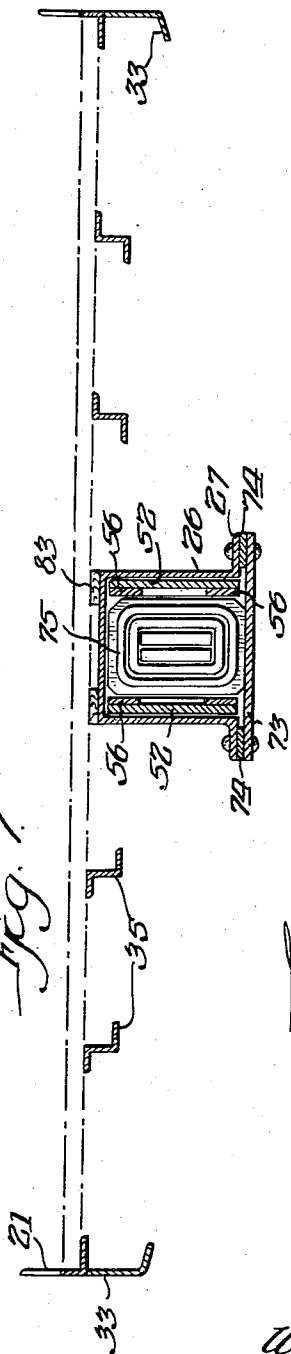


Fig. 7.

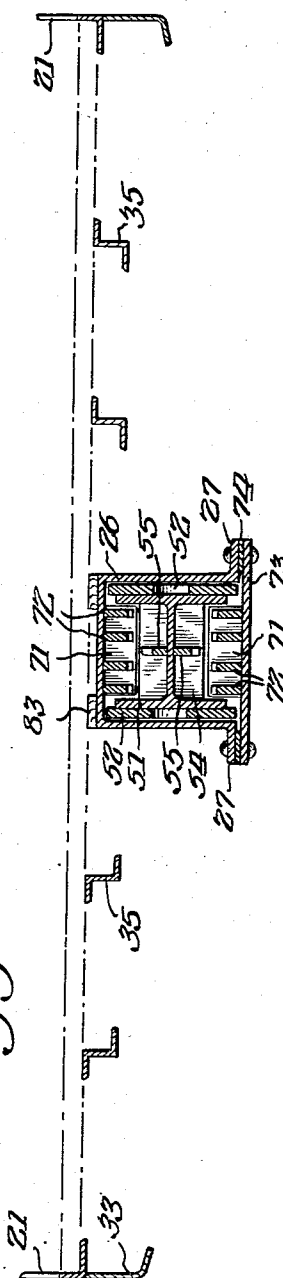


Fig. 6.

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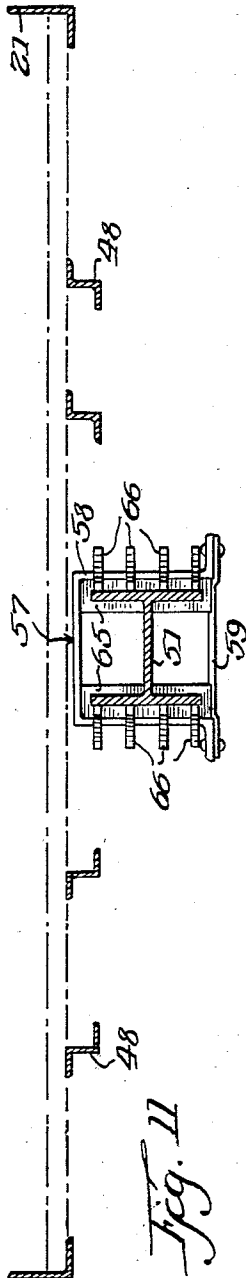


Fig. 10

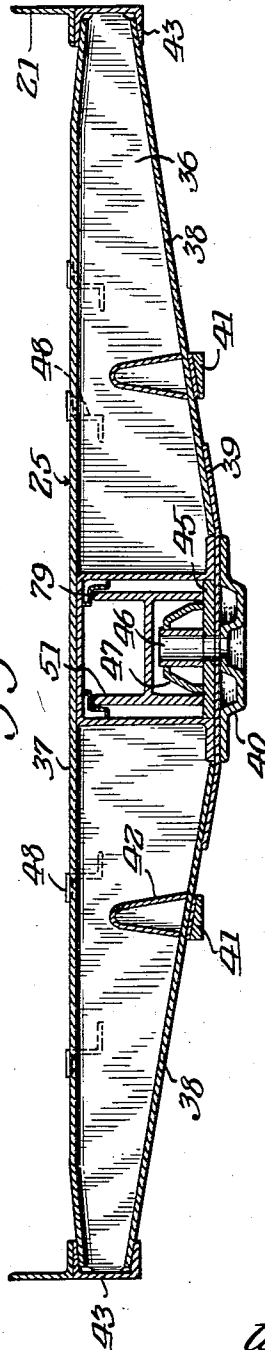
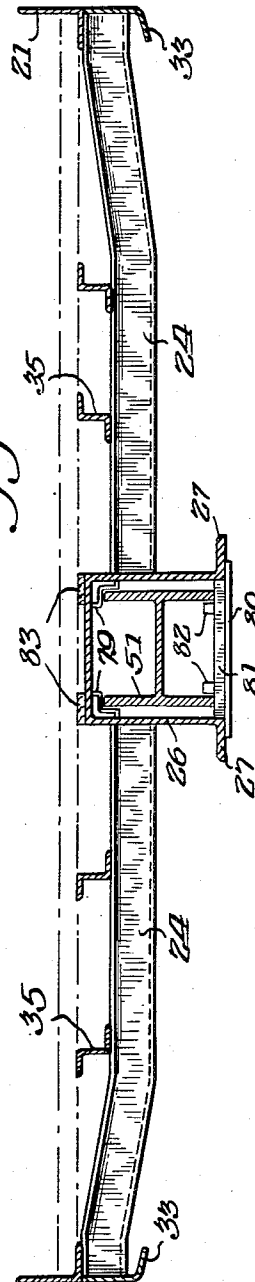


Fig. 9



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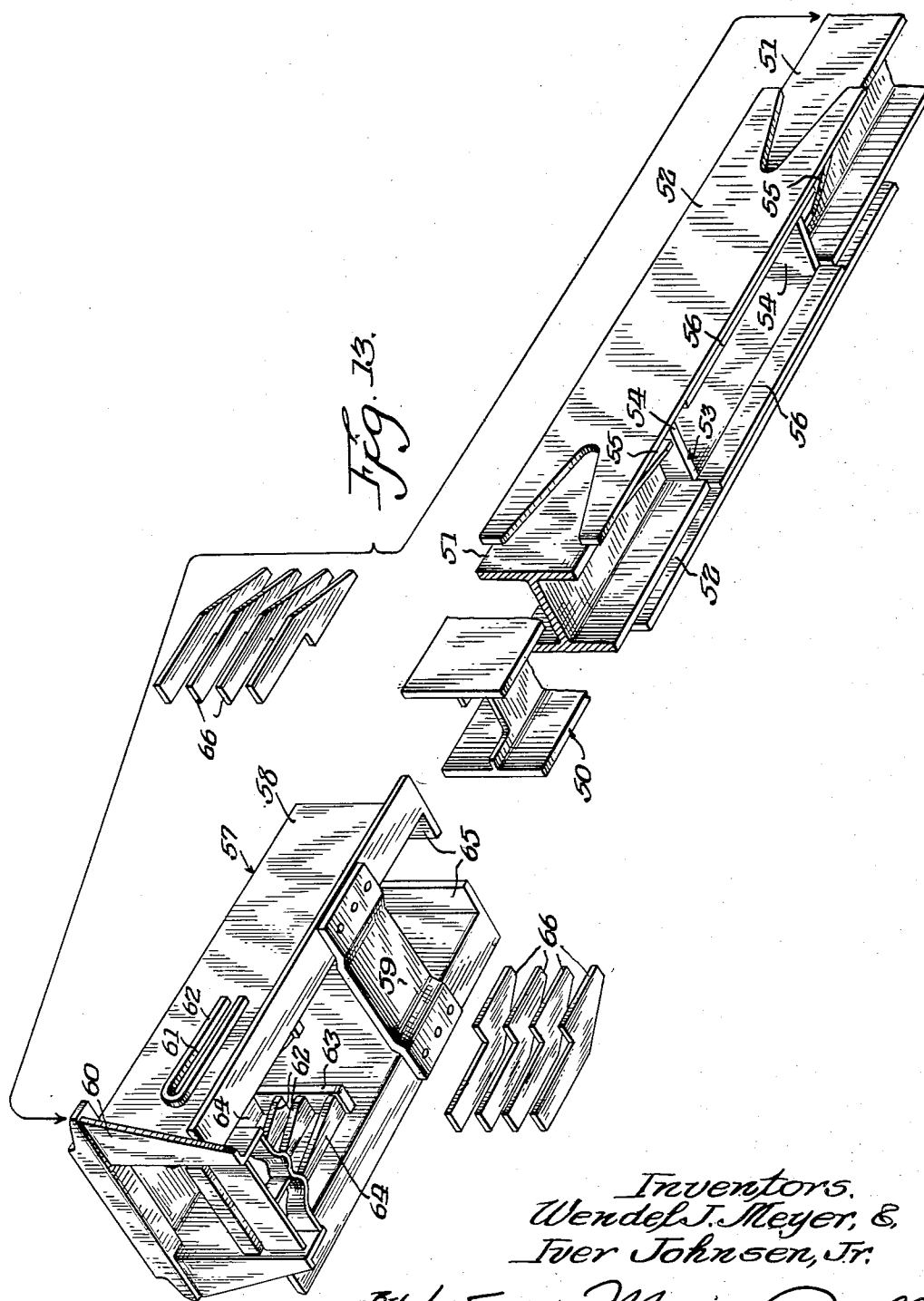
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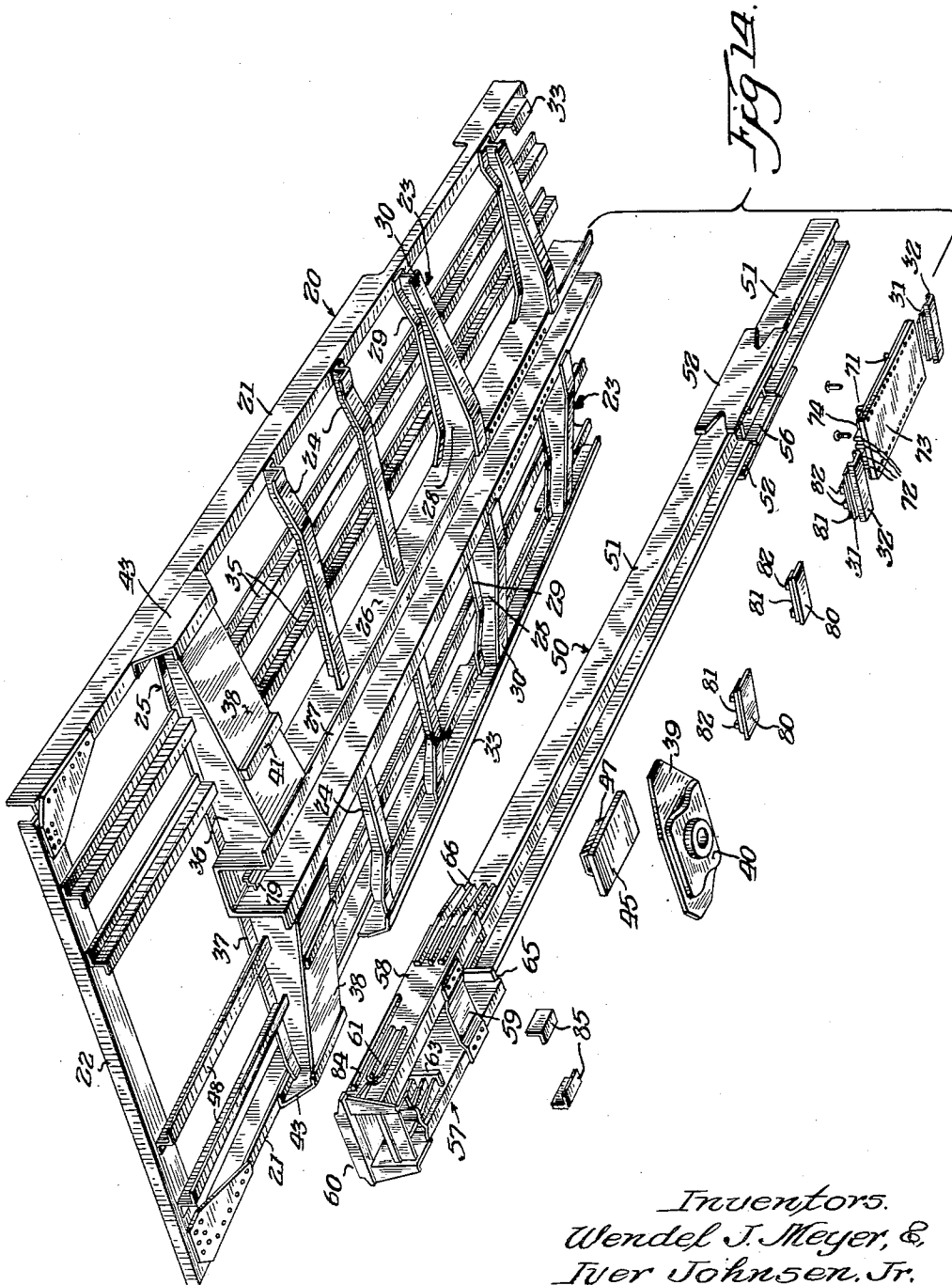
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Application May 29, 1952, Serial No. 290,674

12 Claims. (Cl. 213—8)

The present invention relates to a cushioned draft and buffing column and method of mounting the same, and more particularly to such a column for railway cars especially adapted for application to existing cars and a method of applying it to existing cars involving a minimum of dismantling and affording maximum utilization of existing car parts.

In the illustrative embodiment of the invention disclosed herein, the draft and buffing column, referred to as a draft column for convenience, is in the form of a suitable H-beam extending continuously for substantially the length of the car and is mounted for longitudinal sliding movement in an open-bottom channel-form support which extends through the bolsters and other transverse members of the car underframe, terminating at each end outwardly of the bolster and inwardly of the end sill, the draft column of course also extending through the underframe transverse members. The column has means secured at its ends for mounting the draft gears to which the couplers are connected. In the support for the column, resilient cushioning means are suitably mounted under partial initial compression between abutments rigid with the support, and lug means are fixed on the column to engage opposite ends of the cushioning means, the abutments and lug means being formed and disposed to be clear of each other. Thus upon relative longitudinal movement of the column and support in either direction, the cushioning means are further compressed to absorb the energy applied in causing such movement, or more specifically, a draft or buffing force applied to the column is cushioned by the resilient means in transmission to the car underframe and its effect on the car thereby reduced. In applying this cushioned draft column construction to an existing car, the usual fixed channel-type center sill already on the car is utilized to provide the sliding column support and also the draft gear mounting means for its ends. This is accomplished by cutting off the end portions of the center sill outwardly of the bolsters, cutting a part of each end portion from the inner end thereof, preferably including the rear draft stops but leaving the shortened end portion with the major portion of the draft gear pocket, and welding or otherwise rigidly securing the shortened end portions to the ends of the column with rear draft stop means provided at the junctions of the column and end portions. Provision is thus made for standard draft attachments, which may be inserted at the time of application of the couplers. The bottom plates or sole plates of crossbearers and bolsters and any tie plates or like members blocking the bottom of the center sill, as well as any projections or elements within the center sill which might obstruct the draft column movement, are removed. The abutments for the cushioning means are welded or otherwise fixed in place, the cushioning means inserted, and the draft column disposed in the shortened center sill with the lug means operatively disposed relative to the cushioning means and its ends projecting out of the center sill. Then suitable center pin sockets and filler structures and plates

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are secured at the bolsters and crossbearers as required, and additional tie or cross plates may be secured across the bottom of the center sill, to maintain the column in slidable relation in the center sill.

The invention thus provides a draft column construction which while readily applicable to existing cars with a minimum of dismantling and modification thereof is also readily incorporated in new cars during construction thereof, and in either case is most effective in minimizing the effects of draft and buffing shocks on the car to reduce the possibility of damage to the car as well as its lading. The invention also provides a novel method of providing existing fixed center sill cars with cushioned underframes in a simple and expeditious manner.

It is one object of the present invention to provide a novel and advantageous cushioned draft and buffing column construction for railway cars and the like.

It is another object to provide a cushioned draft and buffing column construction for railway cars and the like adapted for ready application to either existing cars or cars being constructed.

Another object is the provision of a cushioned draft and buffing column construction for railway cars and the like adapted for application to existing cars with a minimum of modification of the car parts.

It is another object to provide a cushioned draft and buffing column construction for railway cars and the like having impact-transmitting connection with the car underframe only through resilient cushioning means.

A further object of the invention is the provision of a simple method of applying a cushioned draft and buffing column to a railway car or the like.

Another object is the provision of a simple and rapid method of applying a cushioned draft and buffing column to a railway car or the like which requires a minimum of operations.

It is another object to provide a method of applying a cushioned draft and buffing column to an existing railway car or the like by which changes in the car parts and dismantling are minimized and maximum utilization of existing car structure is made.

It is a further object to provide a cushioned draft and buffing column construction for a railway car or the like in which the existing center sill is utilized in part to mount a draft column and in part to provide draft gear mounting means at the column ends.

Other and further objects, advantages, and features of the invention will be apparent to those skilled in the art from the following description and the accompanying drawings, in which:

Fig. 1 is a fragmentary plan view of a railway car underframe incorporating the invention;

Fig. 2 is an enlarged fragmentary plan view, partly in section and with parts broken away, of a central portion of the underframe;

Fig. 3 is a longitudinal vertical sectional view taken substantially as indicated by the line 3—3 in each of Figs. 1 and 2;

Fig. 4 is a plan view similar to Fig. 2, but illustrating an end portion of the underframe;

Fig. 5 is a longitudinal vertical sectional view taken substantially as indicated by the line 5—5 in each of Figs. 1 and 4;

Figs. 6 to 12 inclusive are transverse vertical sectional views taken substantially as indicated respectively by the lines 6—6 to 12—12 inclusive in Fig. 1;

Fig. 13 is an exploded perspective view of the draft column assembly, partly broken away; and

Fig. 14 is an exploded bottom perspective view of the underframe and draft column, partly broken away.

Referring to the drawings, the invention is illustrated as incorporated in a railway car underframe generally

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designated 20, of which the major portion extending from one end beyond the central portion thereof is shown, the other end portion being substantially identical to that shown. The underframe 20 comprises side sills 21 and end sills 22, only one of which is shown, extending between and connected to the ends of the side sills by gusset plates or other suitable means. The side and end sills are shown as of the common angle section type. Extending between the side sills are crossbearers 23, crossties 24, and bolsters 25, only one of the latter being shown. A center sill 26 of conventional inverted channel form with outwardly directed flanges 27 at its open bottom is disposed centrally of the side sills 21 and parallel therewith, extending through and connected to the crossbearers, crossties, and bolsters, with its opposite ends lying just outwardly of the bolsters. A pair of crossbearers 23 are disposed at the central portion of the underframe, each comprising a pair of vertical webs 28 extending outwardly from opposite sides of the center sill and top and bottom plates 29 and 30 respectively secured on the upper and lower edges of the webs. The inner ends of the webs and plates are welded or otherwise suitably secured to the center sill, the bottom plates extending under the flanges 27 and having an intermediate plate 31 welded between their inner edges. A reinforcing channel member 32 spans the center sill under the plate 31 and has its flanges welded to the plates 30 and 31 to unite and strengthen against shearing forces the two parts of the crossbearer and to provide for the support of the draft column in the center sill. The outer ends of the crossbearers 23 are welded or otherwise secured to side sill reinforcements 33 in the form of angle members welded to the lower portions of the side sills 21. The upper surfaces of the crossbearers between the side and center sills are depressed below the level of the side sills so as to support conventional Z-bar floor stringers 35 thereon with top surfaces flush with the floor-receiving surfaces of horizontal flanges of the side sills. The crossties 24 are arranged in transversely aligned and longitudinally spaced pairs between the center and end portions of the underframe. Each tie is formed of a Z-bar welded at its outer end to the side sill reinforcement 33 and at its inner end to the center sill 26, and is suitably bent to provide a depressed portion at the level of the depressed portions of the crossbearers so as to similarly support the stringers 35.

As best shown in Figs. 4, 5, and 10, each bolster 25 comprises a pair of parallel diaphragms 36 each divided into two portions extending outwardly from opposite sides of the center sill, to which their inner ends are welded. A top cover plate 37 extending from side to side of the underframe is welded to the upper edges of the diaphragms and overlies the center sill, while bottom cover plates 38 welded on the lower edges of the diaphragms extend outwardly from the center sill with their inner ends welded to the edges of the flanges 27. A sole plate 39 extends under the center sill 26 and laps the bottom plates 38, being secured by welding or other suitable means, and has welded to its lower surface a body center plate 40 of any desired type. Suitable body side bearings 41 are carried on the lower faces of the bottom plates 38, and stiffeners 42 therefor of any desired form are secured in the interior of the bolster. The ends of the bolster 25 are secured to the side sills 21 by connections 43 formed of channel members welded to the lower surfaces of the side sills. The floor stringers 35 terminate at and are connected to the bolsters, their ends being downwardly offset to extend under the bolster top plates 37, which for most of their extent lie just below the level of the floor-receiving surfaces of the side sills and at their ends are bent downwardly to extend into the channel connections 43. A center filler base plate 45 extends between the sides of the center sill immediately above the sole plate 39, and has welded to its upper face a tubular socket 46 for the usual center pin, the plate 45 and sole plate 39 being

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centrally apertured as shown to permit the pin to extend through the pin aperture of the center plate 40 into the socket 46. A center brace 47 of generally channel form with a flat central portion apertured to receive the socket and with outwardly angled flanges is disposed with the flange edges welded to the base plate 45 and the flat portion welded to the upper part of the socket about the aperture. The socket 46 extends upwardly substantially less than half the height of the center sill, so as not to interfere with the draft column, as hereinafter explained. Between each bolster 25 and the adjacent end sill 22 extend floor stringers 48 similar to the stringers 35.

A draft and buffing column generally designated 50, hereafter referred to simply as the draft column for convenience, is provided for disposition in longitudinally slidable relation within the center sill 26, as best shown as a whole in Figs. 13 and 14. This column comprises a pair of longitudinally spaced aligned members 51, in the form of H-beams, connected at their inner spaced ends by plates 52 lapping and welded to the outer faces of their flanges, and having a joined length greater than that of the center sill 26, so that the ends of the members 51 may project beyond the center sill ends, but less than the length of the underframe. The width of the column members together with the thickness of the connecting plates 52 is less than the interior width of the center sill so that the column may slide therein, and the height is less than the depth of the center sill. The height of the plates 52 also is less than the center sill depth, but greater than the height of the column members 51, the plates projecting somewhat above and below the members. Lug means 53 are formed on the inner ends of the column members by abutment face plates 54 and longitudinal bracing ribs 55. Each face plate extends across an end of the opening between the column members substantially at the mid-height thereof, projecting above and below the beam web, and is welded to the connecting plates 52, and the ends of the web and flanges of the adjacent column member. The ribs 55 are disposed on the upper and lower faces of the web and welded thereto with their inner ends abutting and welded to the adjacent plate 54. Spacer bars 56 in this instance thinner than and extending between the ends of the beam flanges above and below the face plates 54 are welded on the inner faces of the connecting plates 52. The outer end of each column member has rigidly connected thereto a draft sill assembly 57 to complete the column 50. Each assembly 57 comprises a draft sill element 58 of the same cross section as the center sill 26 with a suitable draft gear carrier 59 extending across its open bottom and having at its outer end a striking plate 60 or the like of any desired formation. Draft key slots 61 are formed in the webs of the sill member 58 and provided with bearing plates 62 projecting on opposite sides of the webs in a well-known manner. Vertical lug plates 63 are welded to the inner web faces and the rear ends of the bearing plates to provide front draft lugs or stops, backing plates 64 above and below the plates 62 being welded to the sill webs and the lug plates as additional reinforcements. The sill member 58 is connected at its rear or inner end to the outer end of the column 51 by vertical stop plates 65 disposed transversely and extending laterally inwardly from the inner faces of the sill member webs beyond the flanges of the column member, suitably welded in place, and by horizontally disposed reinforcing and connecting rib plates 66 welded to the outer faces of the sill member webs and column member flanges. Each of the rib plates 66 extends across the juncture of the column member with the sill member and has its laterally inner edge formed with an offset so that its forward or longitudinally outer portion engages against the web of the sill member 58 and its rear or inner portion lies against the flange of the column member, with the offset portion abutting and welded to the rear face of the adjacent stop plate. The outer ends of the webs of the column members 51 may be cut away

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as shown at 67 so as to accommodate the draft gear yoke when it is disposed in the draft sill assembly with the other draft gear elements. These elements are not shown and may be of any suitable type for operative connection with a conventional coupler, illustrated in phantom in the drawings at C. The stop plates 65 serve as rear draft lugs or stops cooperating with the front draft stops provided as above described. The draft sill assembly is of such length as to project outwardly beyond the adjacent end sill a greater distance than would a conventional fixed center sill, to allow for longitudinal movements of the draft column, as is usual in cushioned underframes. The draft column 50 comprising the members 51 joined at its central portion and the draft sill assemblies 57 at its ends is adapted to be slidably disposed in the center sill 26, as already stated, extending through the crossbearers 23 and bolsters 25 and between the transversely aligned crossties 24, bridging the sockets 46 and center braces 47 of the bolsters as best shown in Fig. 10.

At the central portion of the center sill between the central crossbearers 23, two longitudinally spaced and opposed pairs of abutments 70 are fixed within the sill, the abutments of each pair being vertically spaced from each other. The longitudinal spacing of the abutments 70 corresponds to that of the lug means 53 of the draft column 50, and their vertical spacing is such as to accommodate the lug means. Each abutment comprises a vertical abutment plate 71 extending transversely of the center sill with its ends spaced sufficiently from the center sill webs to accommodate the draft column flanges and connecting plates 52 therebetween, and suitable bracing ribs 72 extending longitudinally outwardly from the outer face of the abutment plate. The upper plates 71 are welded to the top plate or member of the center sill and to the inner ends of the abutting ribs 72, which are also welded to the center sill top member. The lower plates 71 and ribs 72 are similarly secured on a supporting plate 73 extending below the center sill and riveted or otherwise secured to the flanges 27, suitable filler strips 74 being disposed between the flanges and the side edge portions of the plate 73. Before application of the supporting plate, resilient cushioning means 75 are disposed between the abutments 70 and between the lug means 53, the lug means and abutments of course being properly aligned for this purpose. The cushioning means 75 may be of any desired type, although illustrated as comprising a plurality of plates each having masses of deformable rubber or like material extending therethrough with flat separator plates interposed between the rubber-carrying plates, this type of cushioning means being well known and commercially available and having the advantage of not "going solid" when compressed. Followers 76 are disposed at each end of the cushioning means so as to extend between the cushioning means and the abutments 70 and lug means 53, the longitudinal spacing of which is such that the means 75 when inserted with the followers 76 are under slight initial compression. The resilient cushioning means and followers may be inserted as a unit by suitable use of clamps and/or wedges or other appropriate means, and may be assembled with the center sill and draft column in various ways. For example, they may be inserted between the lug means for disposition between the upper abutments 70 as the column is brought to position in the center sill 26, and between the lower abutments when the plate 73 is brought into place, or may be inserted between the upper abutments in position to be received between the lug means upon disposition of the column in the center sill. Again, the cushioning means may be disposed between the lower abutments 70 on the supporting plate and inserted between the lug means and the upper abutments as the plate is brought to its desired location. To provide for removal of the resilient cushioning means 75 should this ever become necessary, apertures 77 are formed in the center sill top member above the followers 76, through which a suitable tool may en-

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gage the followers to drive out the resilient means after removal of the supporting plate 73. The plates of the resilient means are maintained in proper alignment by the spacer bars 56 and the supporting plate 73 and top member of the center sill, as evident from Fig. 7. The spacer bars 56 and filler strips 74 provide space to accommodate the rubber of the cushioning means when deformed under compression.

The draft column 50 may be disposed in the center sill in any desired manner, most readily by aligning the column with the sill before application to the sill of any transverse members such as the intermediate plates 31 of the crossbearers or the base plates, sole plates, and center bearing plates of the bolsters, and moving the column bodily into the open bottom of the center sill, as well illustrated in Fig. 14. The car or underframe may be tilted or inverted for this operation if desired. The application of the column may either precede or follow the connection of the draft sill assemblies 57 to the ends of the joined column members 51. The order of assembly steps may vary considerably in accordance with available facilities and/or with manufacturing procedures, the disclosed construction lending itself to such variations.

Before the draft column 50 is disposed in the center sill 26, guides 79 are welded to the interior corners of the center sill at the crossbearers, crossties, and bolsters. These guides may be of any suitable form to hold the flanges of the column spaced from the top and sides of the center sill, in the present instance being shown as relatively short plates of W section with the edges welded to the inner surfaces of the sill webs and top member. After insertion of the column in the sill, the supporting plate 73 is fastened in place as described, the crossbearer intermediate plates 31 and channel members 32 are welded across the center sill, and the bolster center filler base plates 45, with the sockets 46 and center braces 47 secured thereto as a subassembly, are welded in place, followed by the sole plates 39 and center plates 40. In alignment with the crossties 24, tie plates 80 are welded to the sill flanges 27, spanning the open bottom of the center sill. Wear plates 81 are disposed on the plates 31 and tie plates 80 to support the column in the center sill, with suitable guide blocks 82 on the upper faces of the wear plates in positions to engage the inner faces of the lower column flanges so as to maintain the column 50 in proper alignment in the sill. The wear plate and guide blocks at each location may be welded together and to the intermediate plate 31 and channel 32, or to the tie plate 81, for application to the center sill as a unit, and the wear plate may additionally be welded to the sill webs, if desired, but preferably the wear plate and blocks form a unit which is welded in place before application of the underlying plate 31 or 80. The column 50 is slidably supported on the wear plates 81 and the base plates 45 of the bolsters, the center braces 47 of the latter serving as lower guides similar to the blocks 82. Furring strips 83 may extend on the top of the center sill to lie beneath the floor in the usual way. Slides 84 in the form of longitudinally disposed bars are welded to the outer faces of the draft sill members 58 below the end sills 22 to engage in angle member guides 85 welded to the lower surfaces of the end sills so as to support the ends of the column in the desired position for longitudinal sliding movement.

Draft and buffing forces to which the car is subjected first act upon the draft gears in the usual way, being transmitted by the coupler C. Such forces if relatively small and therefore within the capacity of the draft gears do not appreciably affect the resilient means 75 because the draft column 50 remains substantially stationary, due to its weight, its resistance to movement resulting from the partial compression of the cushioning means, and absorption of energy by the draft gears. Draft and buffing forces of a magnitude beyond the capacity of the draft gears, however, cause longitudinal movement of the draft column relative to the center sill 26 in one direc-

tion or the other, so that the resilient means are compressed between center sill abutment means 70 at one end and draft column lug means 53 at the other end and thus cushion the impacts on the car occasioned by the forces. It is to be noted that the resilient cushioning means 75 serves as the only impact-transmitting means between the column 50 and the underframe 20, there being no stops or like means for engagement therebetween to limit the relative longitudinal movement of the column, and the center sill, and the underframe is not subjected to shocks arising from draft or buffing forces acting on the draft column except such as pass through the cushioning means and are therefore greatly reduced. While travel of the draft column might be limited by engagement of the inner ends of the ribs 66 against the outer ends of the center sill 26, as a practical matter the cushioning means stops relative movement of the column and sill before the ribs 66 reach the center sill, except under such extreme conditions as would involve destruction of the parts. Upon cessation of moving forces acting on the draft column, the column is returned to its normal centered position by expansion of the resilient means. Damage to the underframe 20 and the car body as well as to lading is avoided or minimized by the reduction of draft and buffing shocks and stresses effected by the present structure.

The cushioned draft column construction of this invention is especially well adapted for application to existing cars of conventional type with a minimum of dismantling and substitution of parts and maximum utilization of the parts already assembled in the car structures. This results principally from the utilization of the existing conventional fixed center sill of a car to provide a housing or support to mount the draft column, as well as to provide the draft sill assemblies for the ends of the column. In applying the present construction to an existing car, the trucks are separated from the car in the usual way, and any tie plates or other parts extending across the open bottom of the center sill or so located in the interior of the sill as to interfere with sliding movement of the column therein are removed or partially cut away, as most convenient or practical. The center sill is cut just outwardly of the bolsters to sever the end portions therefrom, leaving the central or intermediate portion of the center sill fixed in place to serve as the center sill 26 described hereinabove. The center sill end portions are separated from the end sills and also cut just forwardly or outwardly of the rear draft gear stops to provide the draft sill assemblies 57, which by means of the stop plates 65 and connecting ribs 66 may be fixed to the column members 51 as described and used without other change except for the application of the slides 84. Thus the center sill is not removed from the underframe, except for the end portions which are readily accessible for detachment from the end sills and for cutting from the remainder of the center sill, and the removal of which does not materially affect other parts or require dismantling thereof. The old center sill is almost entirely utilized in the new cushioned construction, the end parts being employed without change as the draft sill members of the draft column, and the intermediate part serving as a support or guide for the column and providing a pocket for the cushioning means, only the portions containing the rear draft stops being discarded. It is, however, within the purview of the invention to employ in their entirety the end portions of the old center sill extending from the outer ends to the points of severance from the intermediate portion and including the rear draft stops, by providing suitable means for fixing them to the ends of the members 51, which may be somewhat shortened for this purpose if desired. Before placing the column in the center sill, the upper abutment means 70 and guides 79 are of course secured in place. When the draft column is positioned in the center sill, the cushioning means 75 being inserted in certain of the parts as explained above, the supporting plate 73 with the lower abutment means

thereon is secured to the center sill, the wear plates 81 and guide blocks 82 are applied, as well as the plates 31 and channel members 32 at the crossbearers, tie plates 80 at the crossties, and the center filler and socket subassemblies at the bolsters, the old crossbearer and bolster center filler means being discarded if not adaptable to the new forms. The sole plates 39 and center plates 40 are also applied at the bolsters, these parts being either new or those previously removed from the bolsters, as may be convenient or required by circumstances. The slides 84 and guides 85 may be applied at any appropriate time during the alteration.

While the center sill 26 is shown in the drawings as formed of a pair of Z-members arranged with upper flanges directed toward and welded to each other to provide the top plate of the sill, as is the common practice at present, it may be of other types. For example, the center sill may be formed of a pair of channel members arranged parallel with their flanges directed outwardly, and connected by a cover plate extending over and secured to the upper flanges. Also, while it is advantageous to employ the end portions of a center sill as the draft sill assemblies 57 of the draft column for either new or existing cars, such draft sill assemblies may be otherwise provided if desired.

It will be apparent that we have provided a novel and advantageous cushioned draft column construction and a simple, effective method of applying such a construction, particularly to existing cars, and that the construction and method as illustratively disclosed are readily adaptable to various underframe structures of railway cars and the like.

What is claimed is:

1. A cushioned draft column construction for underframes of railway cars and the like, comprising a center sill adapted to receive slidably therein a continuous draft column and extending through the underframe cross members but terminating short of the end sills, longitudinally spaced abutments fixed on the center sill, resilient cushioning means disposed under partial compression between said abutments, a continuous draft column longer than the center sill slidably mounted therein with its ends projecting therefrom, lug means longitudinally spaced on the column located for engagement with opposite ends of the cushioning means and having clearance relation with the abutments upon relative longitudinal movement of the column and center sill, and means at the ends of the column for mounting draft gears.

2. A railway car having a cushioned draft column, comprising an underframe including a fixed center sill terminating short of the end sills and at least partially defined by a pair of parallel longitudinal members, longitudinally spaced abutments in the center sill, resilient cushioning means under partial compression between said abutments, a continuous draft column slidably mounted in the center sill having a length greater than and its ends extending outwardly beyond the center sill, and lug means longitudinally spaced on the column located for engagement with opposite ends of the cushioning means and having clearance relation with the abutments upon relative longitudinal movement of the column and center sill.

3. A railway car having a cushioned draft column, comprising an underframe including a fixed center sill of hollow section terminating short of the end sills, longitudinally spaced abutments in the center sill, cushioning means under partial compression between said abutments, a continuous draft column slidably mounted in the center sill having a length greater than and its ends extending outwardly beyond the center sill, and lug means longitudinally spaced on the column located for engagement with opposite ends of the cushioning means and having clearance relation with the abutments upon relative longitudinal movement of the column and center sill, said abutments, lug means, and cushioning means pro-

viding the sole impact-transmitting connection between the center sill and draft column.

4. A cushioned draft column construction for underframes of railway cars and the like, comprising a center sill of hollow section extending beyond the cross members of the underframe but terminating short of the end sills, cushioning means disposed between the abutment means, a continuous draft column slidably disposed in the center sill with its ends projecting outwardly thereof and having an aperture therein receiving the cushioning means, means on the column for operative engagement thereof with opposite ends of the cushioning means upon relative longitudinal movement of the column and center sill, and means at the ends of the column for mounting draft gears.

5. A cushioned draft column construction for underframes of railway cars and the like, comprising a center sill of hollow section extending through the cross members of the underframe but terminating short of the end sills, a continuous draft column slidably disposed in the center sill with its ends projecting outwardly thereof, cushioning means operatively disposed between the center sill and draft column restraining relative longitudinal movement thereof, and means maintaining and guiding the column slidably in the center sill.

6. A cushioned draft column construction for underframes of railway cars and the like, comprising a center sill of hollow section extending through the cross members of the underframe but terminating short of the end sills, longitudinally spaced abutment means fixed on the center sill, cushioning means disposed between the abutment means, a continuous draft column slidably disposed in the center sill with its ends projecting outwardly thereof and having an aperture therein receiving the cushioning means, lug means longitudinally spaced on the column for engagement with opposite ends of the cushioning means having clearance relation with the abutment means upon relative longitudinal movement of the column and center sill, and means maintaining and guiding the column slidably in the center sill, said abutment means, lug means, and cushioning means providing the sole impact-transmitting connection between the center sill and draft column.

7. A cushioned draft column construction for underframes of railway cars and the like, comprising a center sill of hollow section extending through the cross members of the underframe but terminating short of the end sills, a continuous draft column slidably disposed in the center sill with its ends projecting outwardly thereof, cushioning means acting between the center sill and draft column to restrain relative longitudinal movement thereof, means of substantially the same cross section as the center sill at the ends of the column for mounting draft gears, and means maintaining and guiding the column slidably in the center sill.

8. A draft column adapted for longitudinally sliding relation within a fixed center sill of a cushioned underframe construction having resilient cushioning means mounted on the sill, comprising an elongated member having an opening therein to accommodate the cushioning means, a plurality of longitudinally spaced lug means on said member to engage opposite ends of the cushioning means, and draft gear mounting means substantially

corresponding to said center sill in cross section fixed on the ends of said member, said draft column having a length greater than that of the center sill.

9. A draft column adapted for longitudinal sliding relation within a fixed center sill of a cushioned underframe construction having resilient cushioning means mounted on said sill, comprising an elongated member, means on said member for operative engagement thereof with said cushioning means to restrain longitudinal movement of the underframe with respect to the member, and an end portion of substantially the same cross section as the center sill fixed to each end of the member, each end portion including draft gear mounting means.

10. A draft column adapted for longitudinal sliding relation with a fixed center sill of an underframe construction mounting impact cushioning means, comprising an elongated draft member longer than the center sill, means on the draft member for operative engagement thereof with said cushioning means to restrain longitudinal movement of the underframe with respect to the member, and draft gear mounting means fixed on the ends of said draft member, said draft gear mounting means comprising end portions of substantially the same cross section as the center sill.

11. A cushioned underframe subassembly adapted for mounting an elongated draft column in longitudinally slidable relation, comprising a pair of side sills, end sills connecting the side sills, cross members inwardly of the end sills connected to the side sills including body bolsters and crossbearers, and a center sill extending through and connected to said cross members terminating short of the end sills and defined by longitudinal members providing an open bottom therefor throughout its length, said bolsters and crossbearers having the portions thereof on opposite sides of the center sill connected to each other by means extending only over the center sill.

12. A cushioned underframe subassembly adapted for mounting in longitudinally slidable relation an elongated draft column, comprising a pair of side sills, end sills connecting the side sills, cross members inwardly of the end sills connected to the side sills including body bolsters and crossbearers, a center sill extending through and connected to said cross members terminating short of the end sills and defined by longitudinal parallel members providing an open bottom therefor throughout its length, and longitudinally spaced abutment means in the center sill for receiving resilient cushioning means therebetween, said bolsters and crossbearers having the portions thereof on opposite sides of the center sill connected to each other by means extending across the center sill only above the open bottom thereof.

References Cited in the file of this patent

UNITED STATES PATENTS

1,430,527	Allen	Oct. 3, 1922
1,884,521	Barrows	Oct. 25, 1932
2,305,518	Dean	Dec. 15, 1942
2,330,706	Hankins et al.	Sept. 28, 1943
2,349,889	Steudel	May 30, 1944
2,405,541	Gerner	Aug. 6, 1946
2,497,048	Simmonson	Feb. 7, 1950