Sept. 28, 1965 W. H. PETERSON ETAL 3,208,599

DUAL SILL SHOCK ABSORBER MOUNTING

Filed Jan. 15, 1964 4 Sheets-Sheet 1

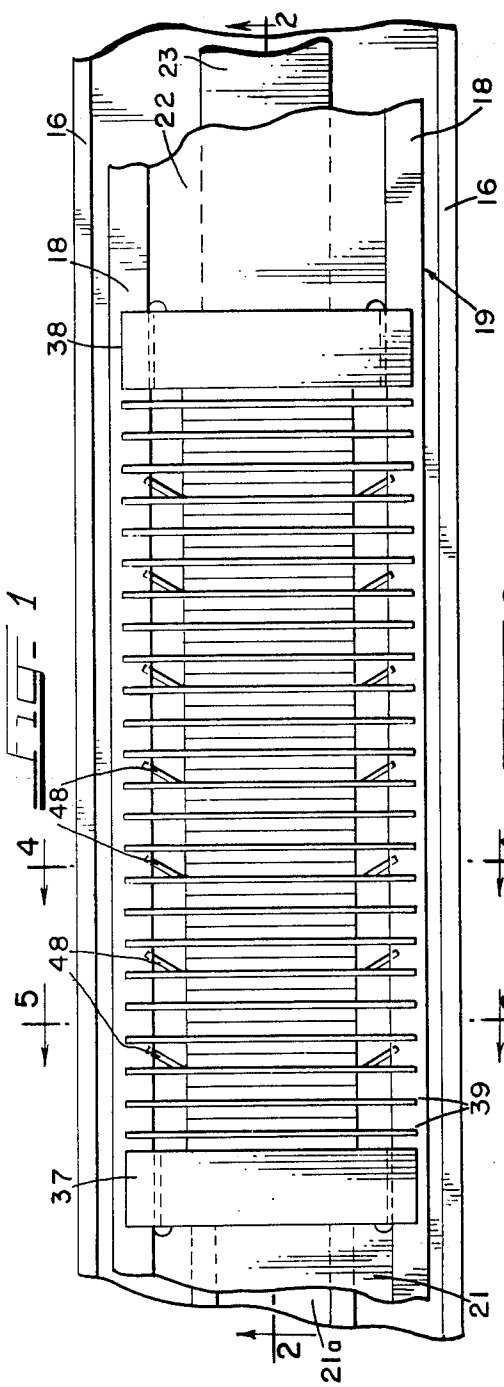

FIG- 1

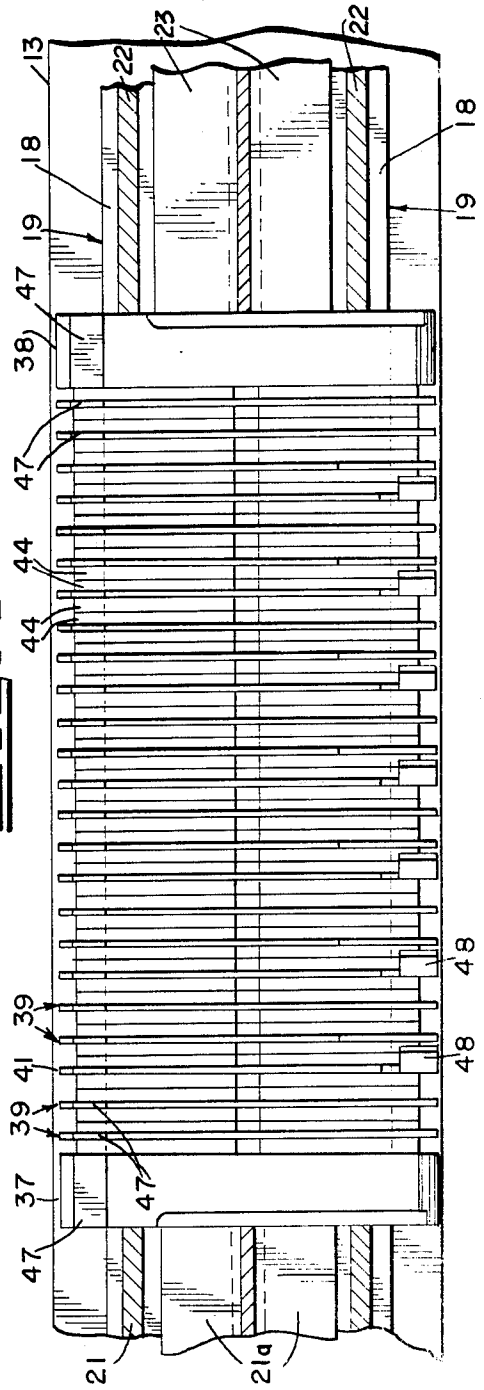

FIG- 2

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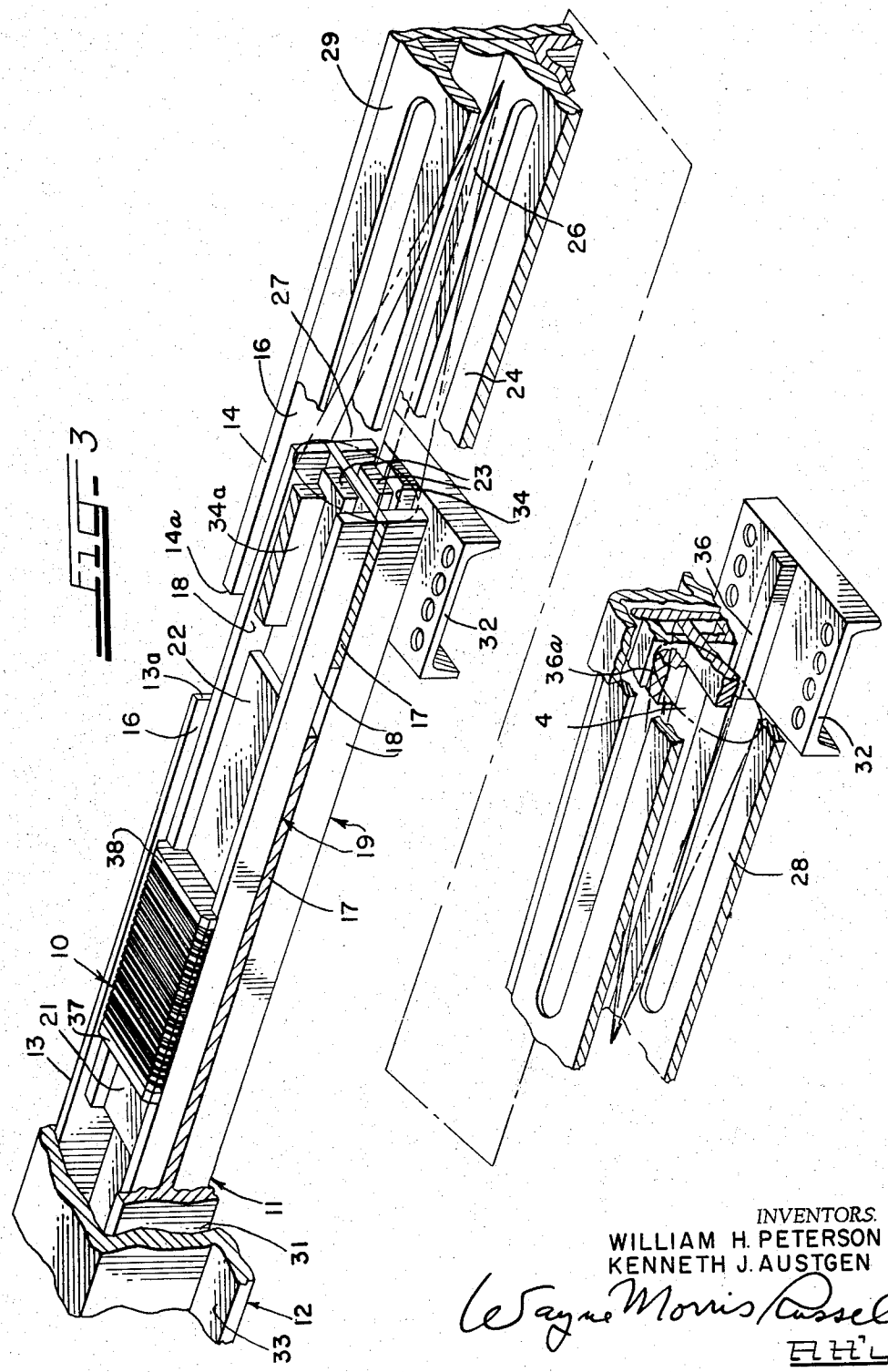
FIG. 3



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DUAL SILL SHOCK ABSORBER MOUNTING

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FIG. 4

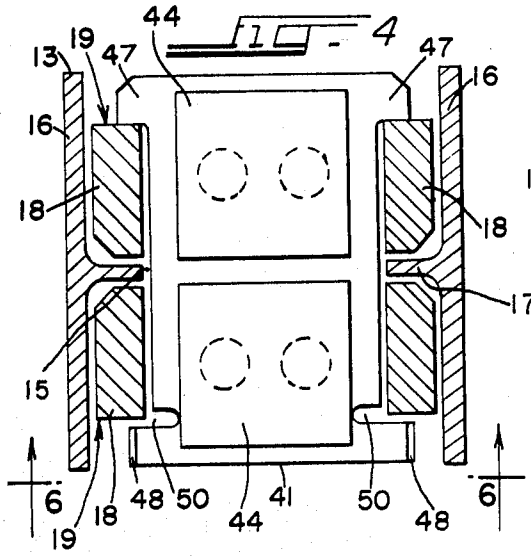


FIG. 5

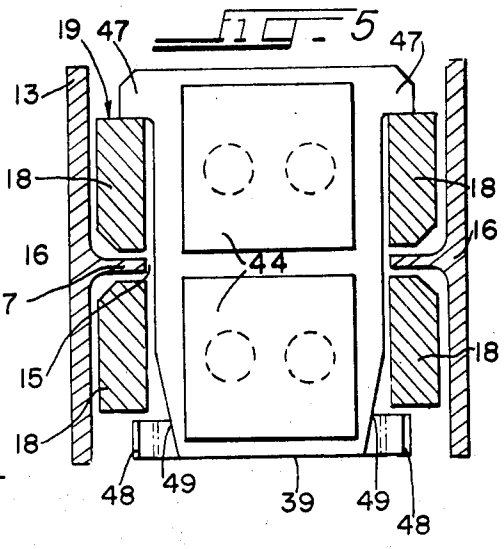
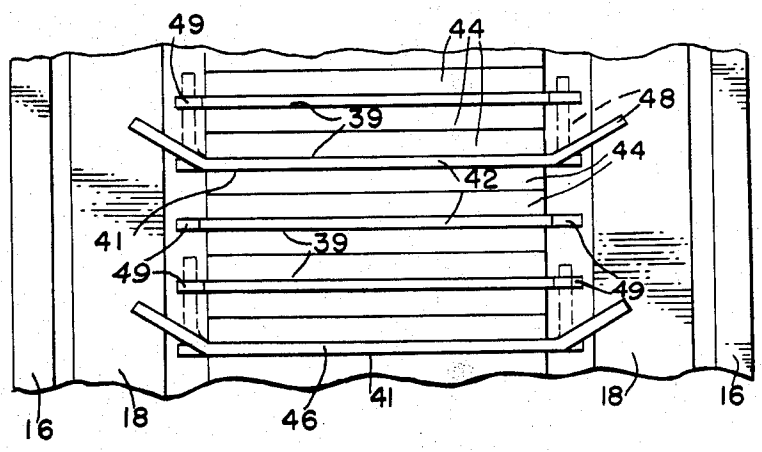


FIG. 6



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DUAL SILL SHOCK ABSORBER MOUNTING

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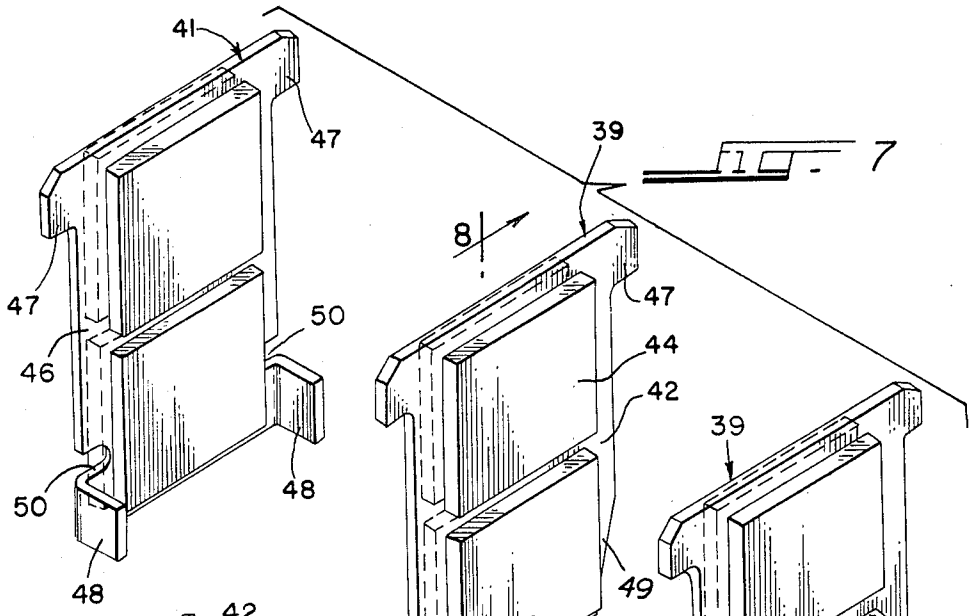

FIG. 7

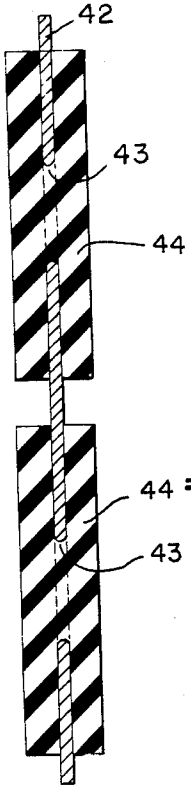

FIG. 8

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DUAL SILL SHOCK ABSORBER MOUNTING

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Filed Jan. 15, 1964, Ser. No. 337,843
4 Claims. (Cl. 213—40)

The present invention relates to resilient shock absorbing devices for railway cars, and more particularly to a new and improved resilient cushion device of the type employed in a dual sliding sill of a cushion underframe railway car wherein the resilient cushion device serves to relieve the tension and compression loading on the sliding sill.

A dual sliding sill to which the resilient cushion device of the present invention relates and to which reference is made for a more detailed description is disclosed in copending U.S. Application Serial No. 196,320 filed May 21, 1962 assigned to the assignee of the present invention. The dual sliding sill comprises generally a pair of sliding sill sections connected for lengthwise movement relative to each other from a neutral position to an abutting position and an extended position upon buff and draft impacts, respectively, on the couplers carried by the remote ends of the sliding sill sections. When the sill sections are in the extended or abutting positions, the sections are conjointly slidable within a more or less standard Z-section stationary sill for lengthwise movement thereof.

Disposed to interact between the sliding sill sections during relative movement thereof to the extended and buff positions so as to relieve the tension and compression loading on the sliding sill is a resilient shock absorbing unit. A cushion unit is also disposed between the stationary sill and the dual sliding sill to interact therebetween and absorb a portion of the coupler impact so as to protect the car body and the lading from damage.

In the preferred form of the invention described in the aforementioned application, the resilient shock absorbing device and the cushion device are arranged so that at least a portion of the travel of the latter is utilized at the same time that the sliding sill sections are traveling to the buff position thereof. In this manner the resisting forces of both the resilient shock absorbing unit and the cushion device are utilized to relieve the compression loading through the sliding sill.

The present invention is directed primarily to the construction of the resilient shock absorbing unit and has for its object to provide an improved resilient shock absorbing unit which facilitates the mounting thereof in the dual sliding sill.

It is a further object to provide an improved resilient shock absorbing device for a dual sliding sill which is of simple construction and economical to manufacture.

It is still a further object to provide an improved resilient shock absorbing device for a dual sliding sill which is constructed to maintain the cushion mounted in the dual sliding sill in a manner substantially precluding lengthwise undulation during compression thereof.

Further objects and features will hereinafter appear:

In the drawings:

FIG. 1 is a fragmentary top plan view of a dual sliding sill embodying a resilient shock absorbing device of the present invention;

FIG. 2 is a cross section view taken generally along the lines 2—2 of FIG. 1 but with the yoke legs along one side being omitted for purpose of clarity;

FIG. 3 is a fragmentary perspective view of the railway car center sill showing the dual sliding sill disposed therein with some of the parts being broken away and in section to show underlying details of structure;

FIG. 4 is an enlarged cross sectional view taken generally along the lines 4—4 of FIG. 1;

FIG. 5 is an enlarged cross-sectional view taken generally along the lines 5—5 of FIG. 1;

FIG. 6 is an enlarged cross-sectional view taken generally along the lines 6—6 of FIG. 4;

FIG. 7 is an exploded view of a set of three of the resilient pad members of which one of the units is provided with restraining tabs and the remaining two are formed with diagonal clearance corners; and

FIG. 8 is an enlarged cross-section view taken generally along the lines 8—8 showing the manner in which the rubber pads are fixed to the metallic discs.

Referring now to the figures, particularly FIGS. 1–6, the resilient shock absorbing device **10** of the present invention is shown in a dual sliding sill **11** which is slidably supported in a center or stationary sill **12** of a railway car having a suitable car body structure.

The dual sliding sill **11** comprises generally a pair of sill sections **13** and **14** movable lengthwise relatively to each other. The sill sections are each preferably formed in an H-section having vertical side webs **16** between the upper and lower edges of which there extends a horizontal web **17**.

The horizontal web **17** of the sliding sill section **13** is formed with a cut-out or opening **15** inwardly of the end which is adjacent to the sill section **14**. Received within the cut out, as more fully to be explained hereinafter, is the resilient shock absorbing device or unit **10**. The resilient shock absorbing device is of the general type including a compressible resilient material which provides a variable increasing force resisting the compression.

Fixed to the sill section **14** for movement therewith are the legs **18** of yokes **19** which extend over the sill section **13** and embrace the resilient shock absorbing device **10** above and below the horizontal web **17** thereof. The legs **18** of the yoke members **19** as shown in FIGS. 4 and 5 are spaced from the vertical webs **16** and horizontal web **17** of the sill section **13** so that the latter is freely movable relative to the sill section **14**.

Extending and fixed across the terminal ends of the legs **18** are draft plates **21** which engage the outer end of the resilient shock absorbing device **10**. Extending and fixed across the yoke legs **18** inwardly of the terminal ends so as to engage the inner end of the resilient shock absorbing device **10** are buff plates **22**. Moreover, fixed to the upper and lower sides of the horizontal web **17** are stop lugs **21***a* which also are engageable with the outer end of the shock absorbing device **10**. At the other end, the resilient shock absorbing device **10** is engageable with the ends of pusher bars **23** fixed to the horizontal web **17** so as to be movable with the sill section **13**.

The pusher bars **23**, as shown in FIG. 3, extend into the sill section **14** in spaced relationship with the upper and lower sides of the horizontal web **17**. The terminal ends of the pusher bars **23** engage a follower plate of a cushion unit **24**. The cushion unit **24** serves primarily to provide lading and car body protection and is also utilized to relieve the compression loading through the dual sliding sill **11** as more fully to be explained hereinafter.

The cushion unit or device **24** is disposed within a cushion pocket **26** including an opening **27** formed in the horizontal web of the sliding sill section **14**. Supporting the cushion device **10** is a bottom cover plate **28** detachably secured across the vertical webs or flanges **16**. Extending across and fixed to the upper edges of the flanges **16** is a top cover plate **29**.

The cushion device **24** may be of any suitable type and may be a long travel hydraulic cushion having a travel of

between about 20 to 40 inches, preferably 30 inches, in either direction. Advantageously, the cushion device may have a substantially constant force-travel closure characteristic. One such cushion device which may be employed is described in U.S. Patent 3,003,436, to which reference is made for a more detailed description.

The above described dual sliding sill **11** is slidably supported with the hollow **31** of the stationary sill by a plurality of lengthwise spaced supporting channels **32** which are detachably secured across the outwardly projecting flanges **33** of the stationary sill **12**. As shown in FIG. 3, two of the supporting channels **32** are located along the ends of the cushion pocket **27**. Fixed to the supporting channels **32** are stop lugs **34** and **36** which contact the opposite ends of the cushion device **24**. Similarly space stop lugs **34***a* and **36***a* are fixed to the top of the stationary sill **12**.

In operation, upon impact at one of the couplers (not shown) carried on the remote ends of the sill sections **13** and **14**, the sill section associated with the coupler receiving the impact moves within the stationary sill in the direction of the force of impact relatively to the other sill section which, at least during the initial impact, remains substantially stationary. Hence, in the event that the impact is applied in draft so that the sill sections **13** and **14** are extended relatively to each other, the draft plates **21** of yokes **19** are operative to compress the resilient shock absorbing unit **10**, so as to resist the force of impact. Similarly, upon buff impact to one of the couplers, the buff plate **22** engages the inner end of the resilient shock absorbing unit so that it is compressed in the direction opposite to that caused by the draft impact.

Generally in train operation the impact encountered in draft is of a lesser magnitude than that encountered in buff impact such that the full length of travel of the resilient shock absorbing unit **10** may not be employed. However, upon buff impact the magnitude of the force is usually such that the full travel of the resilient shock absorbing unit **10** occurs, whereupon the adjacent end faces **13***a* and **14***a* of the sliding sill sections **13** and **14** abut. Under these conditions the resilient shock absorbing device **10** is completely compressed.

During movement of the sill sections **13** and **14** toward the abutting position, the cushion device **24** is concurrently partially compressed against the stationary sill stops **34–34***a* or **36–36***a* which oppose the direction of movement of the sill section against which the impact force is applied. The partial travel of the cushion device **24** thus provides an energy absorbing capacity which is more or less cumulative with that of the resilient shock absorbing device **10**.

When the sliding sill sections **13** and **14** are in abutting position the sill sections move conjointly relatively to the stationary sill **12**. During this conjoint movement the cushion device **24** is further compressed to the full extent of its travel and further sufficient kinetic energy of the impact is absorbed to provide protection for the car body and the lading carried thereon.

As shown, the resilient shock absorbing unit **10** comprises generally an outer follower block **37** which is engageable with the draft plates **21** and an inner follower block **38** which is engageable with the buff plates **22**. Disposed between the outer and inner follower blocks are a plurality of resilient pad units **39** and **41**.

As shown in FIG. 8, the resilient pad units **39** each include a metal plate having openings into which there are molded rubber pads **44**. The resilient pad units **41** are similarly formed with a metal plate **46** having the rubber pads **44** molded thereon. The faces of the rubber pads in the assembled units are in frictional face-to-face contact. During compression thereof, particularly under the impact forces encountered in buff, there is a tendency for the rubber faces to slip such that the resilient shock absorbing unit undulates. Undulation of the resilient shock absorbing device **10** causes portions of the latter to extend beyond the upper edges of the sliding sill flanges such

that it engages the inner top wall of the stationary sill and interferes with the lengthwise movement of dual sliding sill within the stationary sill and thereby reduces the effectiveness of the cushion unit in achieving lading and car body protection.

In accordance with the present invention the resilient pad units **39** and **41** are constructed so as to obviate the problem of undulation during compression. This is accomplished by forming the metal plates **42** and **46** and the follower blocks **37** and **38** with outwardly projecting shoulders **47—47** at the upper ends thereof which overlie the yoke legs **18** of the upper one of the yokes **19**. In this manner the follower blocks **37** and **38** and resilient pad units **42** and **46** are supported within the web opening **15**. To preclude the upward undulation, selectively spaced between the follower blocks **37** and **38** the metal plates **46** of the units **41** are formed with bendable restraining tabs **48** which are adapted to underlie the yoke legs **18** of the lower one of the yokes **19**. The tabs **48** in the operative position shown in FIGS. 1 and 6 are bent at an angle with respect to the plane of the metal plates, say, for example, at angle of about 60°.

As shown in particular in FIG. 7, prior to the installation of the resilient pad units **41** the tabs **48** are bent at a right angle to permit the insertion through the opening **15**. When thus bent the tabs **48** are of such length as to underlie and project above the lower edge of the metal plates **42** of the units **39**. To avoid striking of the lower edge, the lower corners are formed with a bevel **49** sufficient to accommodate the right angularly bent tabs **48**. After the resilient shock absorber unit **10** is disposed and assembled within the opening **15** with the shoulders engaging the legs **18** of the upper yoke **19**, the tabs are bent to the 60 degree angularity. To facilitate the bending of the tabs to and from the right angular relationship the side edge of the plate **46** above the tabs are indented as by elongate cut-outs **50**.

What is claimed is:

1. A resilient shock absorbing device for a dual sliding sill comprising a pair of longitudinally spaced follower blocks, a plurality of resilient pad units disposed between said blocks, said resilient pad units each including a metal plate, resilient compressible pads on said metal plates on the opposite faces thereof, said resilient compressible pads of each of said units being in face-to-face relationship, outwardly projecting horizontal shoulders formed on the upper ends of said follower blocks and said metal plates, said shoulders being adapted to support said follower blocks and said resilient pad units on yoke leg means of said dual sliding sill, and at least some of said metal plates having tabs along the lower portions thereof bent at an angle relative to the plane of said plate so as to be adapted to underlie the underside of said yoke leg means of said dual sliding sill so as to limit vertical movement of said resilient shock absorbing device upon compression thereof.

2. A resilient shock absorbing device for a dual sliding sill comprising a pair of longitudinally spaced follower blocks, a plurality of resilient pad units disposed between said blocks, said resilent pad units each including a metal plate, resilient compressible pads molded on said metal plates on the opposite faces thereof, said resilient compressible pads of each of said units being in face-to-face relationship, horizontal shoulders formed on the upper ends thereof and projecting outwardly of the sides so as to be supported on yoke leg means of said dual sliding sill, and at least some of said metal plates having bendable tabs projecting horizontally from the sides of said plates along the lower ends thereof so as to underlie said yoke leg means of said dual sliding sill and thereby to limit vertical movement of said resilient shock absorbing device upon compression thereof.

3. The invention a defined in claim **2** wherein said bendable tabs are bent at an angle of about 60° relative to the plane of said plates.

4. In a dual sliding sill having a pair of sill sections movable lengthwise relatively to each other, yoke means mounted for movement with one of said sill sections, a resilient shock absorbing unit opening in the other of said sill sections, said yoke means being alignable with said opening, and a resilient shock absorbing device disposed within said other of said sliding sill sections, said resilient shock absorbing device comprising a pair of longitudinally spaced follower blocks, a plurality of resilient pad units disposed between said blocks, said resilient pad units each including a metal plate, resilient compressible pad mean fixed to the opposite faces of said plate, said follower blocks and said resilient pad units being disposed within said opening transversely to the longitudinal axis of said sill sections with said compressible resilient pads in face-to-face relationship, horizontal shoulders formed

on the upper ends thereof and projecting outwardly of the sides thereof so as to overlie and be supported on said yoke means, and at least some of said metal plates having bendable tabs horizontally projecting from the lower end of the sides of said plates to underlie said yoke means and thereby to limit vertical movement of said resilient shock absorbing device upon compression thereof.

References Cited by the Examiner

UNITED STATES PATENTS

2,781,135	2/57	Spence et al.	213—40
3,095,094	6/63	Lich	213—8

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