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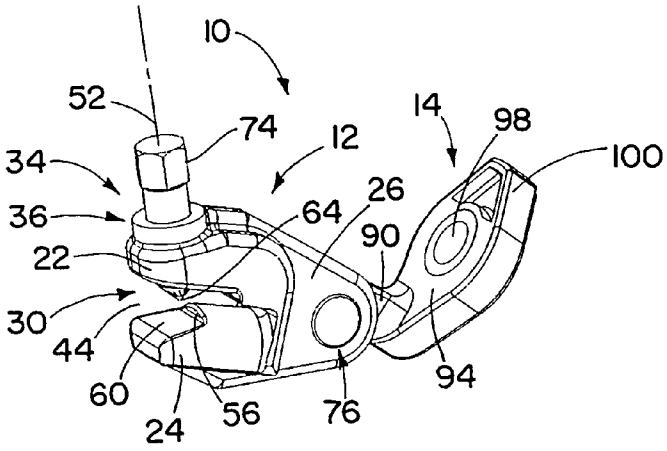

FIG. 1

(57) Abstract: A structural attachment fitting for bracing includes a clamp, and a bracket pivotally coupled to the clamp. The structural attachment fitting is part of a sway brace assembly for providing sway bracing for a conduit, pipe, or other system. The clamp is a generally C-shape clamp having a slot for receiving different types of sway braces, such as pipe, angle, or strut. The slot has multiple sections or parts configured to receive different thicknesses of material. A lower leg of the clamp may have a rounded top surface that better engages a pipe used as a sway brace. A set screw of the clamp is tightened to presses the sway brace against a step on the lower leg of the clamp. The set screw is angled toward a closed end of the slot. The pressing of the set screw tip against the sway brace deforms the sway brace material.

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UNIVERSAL STRUCTURAL ATTACHMENT FOR SEISMIC BRACE

BACKGROUND OF THE INVENTION

FIELD OF THE INVENTION

[0001] The invention is in the field of seismic bracing, sway bracing, structure attachment fitting, and seismic restraint.

DESCRIPTION OF THE RELATED ART

[0002] Seismic sway bracing is often required for plumbing systems, fire sprinklers, electrical systems, heating conduits, ventilation conduits, air conditioning conduits, and other structural and non-structural components of a building as well as some equipment installed in buildings. One way of sway bracing is to couple a system to be braced to a pipe or other rigid structural member that is in turn coupled to building structure, such as a wall. Improvements would be desirable in bracing for pipes, conduits, and other objects.

SUMMARY OF THE INVENTION

[0003] A structure attachment fitting is configured to serve as one component within a bracing system used to prevent swaying of pipes or other loads suspended from ceilings, beams, or other structures. The fitting rigidly clamps one end of a sway brace while the other end of the sway brace is connected to the load.

[0004] In general, a clamp, used to firmly grip a sway brace, and a bracket, provides a point of attachment to the building structure. The clamp and bracket are connected so the clamp can pivot to different bracing angles. The internal geometry of the clamp is such that when a set screw is threaded through the clamp, the screw contacts the sway brace and firmly wedges the brace between the set screw and clamp body. The objective of the design was to provide a robust method to grip all of the most commonly used sway braces (most specifically pipe, angle, and strut).

[0005] According to an aspect of the invention, a clamp has an internal throat geometry of the clamp that has an angled step that positions the sway brace so that the central axis of the sway brace is oriented substantially non-perpendicular to the central axis of the set screw used to grip the sway brace. The axis of the clamping

set screw may be placed substantially close to the edge of the angled step, allowing the sway brace to be firmly wedged between the screw and the step.

[0006] According to another aspect of the invention, two different sized slots may be used to receive different size sway braces. The smaller slot is sized to accommodate 1-2 inch (25.4-50.8 mm) pipe and strut, while the larger slot is sized to accommodate 0.25 inch (6.4 mm) thick flat stock, angle iron, or other 0.25 inch (6.4 mm) thick structural steel. The smaller slot may be tapered such that sway braces of different wall thickness (i.e. 1 inch (25.4 mm), 1.25 inch (31.8 mm), 1.5 inch (38.1 mm) pipe, etc.) will fit snugly within the slot, specifically such that the outside surface of the sway brace will be in close contact with the top surface of the slot. The contact between the top of the sway brace and top surface of the slot prevents the portion of the sway brace located behind the set screw from rotating up, thus allowing all of the energy delivered by the set screw to work toward deforming/wedging the sway brace.

[0007] According to yet another aspect of the invention, a clamp for clamping a sway brace includes use of a break away head screw to insure proper screw loading is obtained.

[0008] According to still another aspect of the invention, a sway brace clamp has a geometry that helps guide each type of the bracing material to a desired final position (i.e. round guide for pipe, second step for angle, and first step for pipe and strut).

[0009] According to a further aspect of the invention, a sway brace clamp has a set screw that is oriented non-perpendicular with respect to the central axis of the bracing member. This provides the wedging action that traps the brace member inside the clamp.

[0010] According to a still further aspect of the invention, a set screw for a sway brace clamp has a tip that is located very close to the step on the throat of the clamp, such that the screw tip pinches the brace material securely against a step of the clamp.

[0011] According to another aspect of the invention, a sway brace bracket has a tab included to reduce the prying of the bracket against the structure when a load is applied.

[0012] According to yet another aspect of the invention, a seismic brace structure attachment fitting includes: a seismic brace clamp that includes: a main body; and an upper leg and a lower leg attached to the main body; and a bracket pivotally coupled to the clamp. The upper leg and the lower leg define a slot therebetween. The slot includes a pair of slot portions having different respective heights for receiving objects of different thickness.

[0013] According to still another aspect of the invention, a seismic brace structure attachment fitting includes: a seismic brace clamp that in turn includes: a main body, and an upper leg and a lower leg attached to the main body; and a bracket pivotally coupled to the clamp. The upper leg and the lower leg define a slot therebetween. The slot includes a pair of slot portions configured for receiving objects of different thickness.

[0014] According to a further aspect of the invention, a method of seismic bracing includes: attaching a seismic brace to a seismic brace clamp, wherein the attaching includes: inserting the seismic brace into one of a pair of slot portions, configured for receiving objects of different thickness, between upper and lower legs of the seismic brace clamp; and tightening a set screw against the seismic brace; and coupling the seismic brace clamp to building structure, using a bracket that is pivotally coupled to the clamp.

[0015] To the accomplishment of the foregoing and related ends, the invention comprises the features hereinafter fully described and particularly pointed out in the claims. The following description and the annexed drawings set forth in detail certain illustrative embodiments of the invention. These embodiments are indicative, however, of but a few of the various ways in which the principles of the invention may be employed. Other objects, advantages and novel features of the invention will become apparent from the following detailed description of the invention when considered in conjunction with the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] Annexed are drawings depicting one or more embodiments of the invention. The drawings are not necessarily to scale.

[0017] Fig. 1 is an oblique view of a structure attachment fitting in accordance with an embodiment of the invention.

[0018] Fig. 2 is a side view of the structure attachment fitting of Fig. 1.

[0019] Fig. 3 is a side view of a portion of the structure attachment fitting of Fig. 1, showing deformation of sway brace material.

[0020] Fig. 4 is an exploded view of the structure attachment fitting of Fig. 1.

[0021] Fig. 5 is a side view of a sway brace assembly that includes the structure attachment fitting of Fig. 1.

[0022] Fig. 6 is a side view of the structure attachment fitting of Fig. 1, attached to pipe.

[0023] Fig. 7 is a side view of the structure attachment fitting of Fig. 1, attached to angle.

[0024] Fig. 8 is a side view of the structure attachment fitting of Fig. 1, attached to strut.

[0025] Fig. 9 is an oblique view of an alternate embodiment structure attachment fitting according to the present invention.

[0026] Fig. 10 is a side view of the structure attachment fitting of Fig. 9.

DETAILED DESCRIPTION

[0027] A structure attachment fitting for bracing includes a clamp, and a bracket pivotally coupled to the clamp. The structural attachment fitting is part of a sway brace assembly for providing sway bracing for a conduit, pipe, or other system. The clamp is a generally C-shape clamp having a slot for receiving different types of sway braces, such as pipe, angle, or strut. The slot has multiple sections or parts configured to receive different types of sway brace. The different slot sections may have different spacings for receiving different thicknesses of material. One of the slot sections may have a constant height (spacing), while the other section may be tapered down from that height to allow entry of thinner sway brace material. A lower leg of the clamp may have a rounded top surface that better engages a pipe used as a sway brace. A set screw of the clamp is tightened to presses the sway brace against a step on the lower leg of the clamp. The set screw is angled toward a closed end of the slot. The pressing of the set screw tip against the sway brace deforms the material of the sway brace. This helps secure the sway brace in the clamp.

[0028] Following are relevant definitions:

1) STRUCTURE ATTACHMENT FITTING – A device used to attach a sway brace directly to the building structure;

2) SWAY BRACE – A rigid structural member, typically a piece of steel pipe, strut or angle, intended to attach the sprinkler system pipe (or other object to be braced) to a building structure using a sway brace fitting attached to the sway brace and sprinkler system pipe (or other object to be braced); and a structure attachment fitting attached to the sway brace and building structure;

3) SWAY BRACE ASSEMBLY – A structural system consisting of a sway brace connected to a sway brace fitting attached to the sprinkler system pipe (or other object to be braced) on one end and connected to a structure attachment fitting attached to the building on the other. These assemblies are intended to connect sprinkler system piping or other piping systems (or other object to be braced) to a building structure to provide resistance to relative horizontal movement between the building and the sprinkler system piping or other piping systems (or other object to be braced) during an earthquake or other shock waves impacting a building; and

4) SWAY BRACE FITTING – A device used to attach a sway brace to the sprinkler system piping (or other object to be braced).

[0029] Referring initially to Figs. 1 and 2, a structure attachment fitting 10 includes a clamp 12 and a bracket 14. The clamp 12 is used to receive and hold a sway brace, such as a piece of pipe, strut, or angle, as part of a sway brace assembly. The bracket 14 is hingedly coupled to the clamp 12, allowing a change of relative angle between the bracket 14 and the clamp 12. The bracket 14 is used to couple the structural attachment fitting 10 to building structure, such as a wall or ceiling.

[0030] The clamp 12 has a C-shape, with an upper leg (or member or body portion) 22 and a lower leg (or member or body portion) 24 extending from a central body 26. The legs 22 and 24 define a slot or opening 30 between them for receiving and securing a sway brace. A set screw 34 is in a threaded hole 36 in the upper leg 22, and is used to bear against and deform sway brace material in the slot or opening 30, to secure the sway brace in the slot 30.

[0031] The slot 30 has two or more portions for receiving and securing different types of sway brace material. (The slot portions are sometimes referred to herein as "slots.") In the embodiment shown in Figs. 1 and 2 the slot 30 has a relatively deep (or thick) slot portion 40 and a relatively shallow (or thin) slot portion 42. The slot

portion 40 has a depth (height) that is greater than that of the slot portion 42, allowing the slot portion 40 to receive and hold thicker sway braces than can fit in the shallow slot portion 42. The slot portions 40 and 42 are parts of the same slot 30. The relatively deep slot portion 40 is closer to a throat 44 of the slot 30, with the result that objects must pass through the deep slot portion 40 in order to reach the shallow slot portion 42.

[0032] The slot portions 40 and 42 have respective stops 46 and 48 that limit insertion of sway braces or other objects into them. The stop 46 is downward-protruding surface 50 of the upper leg 22. The stop 46 limits insertion into the slot 30 of objects (such as sway braces) that are too thick to enter into the slot portion 42. The stop 46 has a curved shape that urges smaller objects toward the smaller slot portion 42. Thus the stop 46 operates to both limit entry into the slot 30 of thick items, and to facility further entry in the slot 30 of thinner items.

[0033] As noted earlier, the clamp 12 is generally C-shaped, with the upper and lower body portions 22 and 24 of the body being divided by the slot portions 40 and 42. The slot portions 40 and 42 are sized to receive and guide different sway braces. The larger slot 40 accommodates braces of about 0.25 inch (6.8 mm) wall thickness. The smaller slot 42 accommodates 1-2 inch (25.4-50.8 mm) pipe. The starting point of the smaller slot 42 provides a positive stop for sway braces using the larger slot 40. The smaller slot 42 may be tapered such that the height of the slot 42 is largest at its starting point, and smallest at its closed end, which acts as a stop 48.

[0034] A sway brace of wall thickness 0.25 inch (6.8 mm) will be inserted into the clamp until the brace reaches the end of the larger slot 40. A 1-2 inch (25.4-50.8 mm) pipe will be inserted into the smaller (tapered) slot 42 until the brace contacts the back of the slot 42. In all cases after being inserted into the clamp the top of the brace will either be in contact with, or be in very close proximity to the top surface of one of the two slots 40 and 42.

[0035] As noted above, the upper portion 22 of the clamp 12 has a threaded hole 36 to receive the set screw 34. The axis 52 of the threaded hole 36 is oriented non-perpendicular to the slot portions 40 and 42, angled toward the clamp body 26. The axis 52 may be at an angle of 20 degrees from perpendicular to the slot portions 40 and 42, with a tolerance of 1 degree. More broadly, the angle may be in the range of 15 to 25 degrees from the perpendicular (65 to 75 degrees relative to the slot

portions 40 and 42), or even outside that range. The lower portion 24 of the clamp 12 has a generally round shape upper surface 54 which serves as a guide when pipe is used as the brace. The lower portion 24 of the clamp 12 also has a step 56 that may be oriented parallel to the axis 52 of the threaded hole 36. The step 56 is positioned close to, but slightly behind (toward the clamp body 26) the axis 52 of the set screw 34 and the set screw hole 36. For example the axis 52 may pass within 0.15 inches (3.8 mm) of the step 56, or more broadly pass within 0.1 to 0.2 inches (2.5 mm to 5.1 mm) of the step 56. The step 56 is closer to the main body 26 than is where the axis 52 is closest to the step 56.

[0036] Near the throat 44, farther from the clamp body 26 than the step 56, the lower leg 24 has a sloped flat surface 60. The slopes surface 60 is angled away from the slot 30 at the throat 44 of the slot 30. This provides a bigger (taller) opening for the slot 30, which facilitates guiding the sway brace into the slot portions 40 and 42 as the sway brace is inserted into the clamp 12.

[0037] Referring now in addition to Fig. 3, a set screw 34 with a cone point or other tip 64 may be used to engage the bracing member (sway brace) 66 once the sway brace 66 is inserted into the clamp 12. With the brace 66 being restricted by its snug fit in one of the two slot portions 40 and 42, the downward force applied by the set screw 34 efficiently displaces the brace material 70 around the step 56. As the set screw tip 64 continues to move downward some of the displaced brace material 70 becomes securely wedged between the set screw tip 64 and the step 56 in the lower clamp body or leg 24. The step 56 in the lower clamp body 24 is deep enough to allow the set screw 34 to displace an ample amount of sway brace material. The large angle at which the set screw 34 is placed relative to the brace 66 also causes the set screw 34 to more firmly dig into/engage the brace material when a tensile load is applied to the brace 66.

[0038] A screw head 74 of the set screw 34 is hexagon shaped and is configured to shear off once the proper installation torque has been applied.

[0039] At the rear of the clamp 12 is a clearance hole 76 in the clamp body 26. The hole 76 may be sized to accept a standard 0.5 inch (12.7 mm) bolt, or another suitable fastener.

[0040] In one embodiment the clamp 12 is a casting made from ductile iron, cast iron, or other suitable material. Ribs and bosses, such as the ribs 78 and 80, are

included in areas of the clamp 12 to ensure strength while minimizing material usage. Radii are placed at terminating sections to alleviate and minimize stress concentrations.

[0041] Referring now in addition to Fig. 4, the clamp 12 is connected to structure by means of the bracket 14. The bracket 14 is bolted to the back of the clamp 12 with a hex bolt 84 and a hex nut 86, although it will be appreciated that other fasteners and types of connections may be used instead. The hex bolt 84 couples the clamp main body 26 to an arm 90 of the bracket 14. The arm 90 has a clearance hole 92 in it, and the bolt 84 passes through the holes 76 and 94 in the clamp 12 and the bracket 14. The bolted joint is pre-arranged during assembly to provide free rotation with a fixed gap between the clamp 12 and the bracket 14.

[0042] The bracket 14 has a bracket body 94 with a flat surface 94 for bearing against structure. The arm 90 which extends down from the flat body 94 at a slightly obtuse angle, for example at about 10 degrees off of perpendicular. The end of the arm 90 has the clearance hole 92 for the 0.5-inch (12.7-mm) bolt 84 (or other suitable fastener. This is where the bracket 14 is connected to the clamp 12. The arm 90 is oriented at a slightly obtuse angle to ensure adequate clearance for tools used to mount the bracket 14 to structure. Furthermore the arm 90 may be positioned so that the center of the clamp 12 (a central plane of the clamp 12) is in substantially line with the axis of a mounting hole 98 in the bracket body 94.

[0043] The bracket 14 is configured with ample thickness to ensure proper resistance to loading. Proper radii are included at section interfaces, particularly where the flat mounting section 94 and the arm 90 meet, to prevent unnecessary stress concentrations.

[0044] A tab 100 also extends off from the back of the mounting surface to help prevent the bracket 14 from prying away from structure when loads are applied through the arm 90.

[0045] The bracket 14 may be a casting made from ductile iron or another suitable material.

[0046] The structure attachment fitting includes the clamp 12, the set screw34, the bracket 14, the bolt 84, and the nut 86. Fig. 5 shows an example of a sway brace assembly 120 used to secure a pipe or other object (or load) 124 against swaying. The sway brace assembly 120 includes the structure attachment fitting 10,

which is used to secure the sway brace 66 to building structure 126, such as a ceiling, beam, or other suitable structure. A sway brace fitting 130 is used to attach the sway brace 66 to the pipe or other load 124. Examples of suitable sway brace fittings may be found in co-owned U.S. Patent Application Publication No. US 2008/0251651 A1, the figures and description of which are incorporated herein by reference.

[0047] Figs. 6-8 show engagement of the structure attachment fitting 10 with different types of sway braces 66. Fig. 6 shows use of a pipe 140 as the sway brace 66, with the pipe being inserted all the way into the slot portion 42. Fig. 7 shows use of angle iron 144 as the sway brace 66, with the angle iron 144 secured in the slot portion 40 because it is too thick to enter into the slot portion 42. Fig. 8 shows strut 148 used as the sway brace 66, with the strut 148 being inserted fully into the slot portion 42.

[0048] It will be appreciated that there are many advantages to the structure attachment fitting 10 described above. One advantage is the installation of brace members (sway braces) into clamp 12. The internal geometry of the clamp slot 30, with its two slot portions 40 and 42, allows better guiding and securing of bracing members of different wall thickness. The larger slot portion 40 is configured to receive for 0.25 inch (6.4 mm) thick structural steel braces, or other sway braces or items of similar thickness. The smaller slot portion 42 is tapered such that 1-2 inch (25.4-50.8 mm) diameter pipe will fit more snugly within the slot than in prior clamps, which have been oversized when used with sway braces considerably smaller than 0.25 inch (6.4 mm). Thus the clamp 12 solves the problem of providing a more snug fit for sway braces of varying thicknesses and configurations.

[0049] Another advantage is that the orientation of the set screw 34 relative to brace member 66 combined with snug fit of brace in slots: improved wedging of brace material. The set screw 34 is oriented non-perpendicular to the inserted brace member (sway brace). This allows the screw to more effectively wedge the brace material 66 in the clamp 12. Additionally the large angle of the set screw 34 is such that as a tensile load is applied the tip 64 of the screw 34 more firmly digs into the brace material 66. Additionally the snug fit between the brace material 66 and the slot portions 40 and 42 restricts the sway brace from moving/rotating upward when the set screw applies downward force on the brace. This allows more of the force

delivered by the set screw 34 to be used for bending/wedging the brace material. Additionally it provides another point of contact between the clamp 12 and the sway brace 66. In the prior art the set screw 34 is oriented perpendicular or generally perpendicular to the brace material 66. Additionally in other clamps the fit between the slot and the braces is often sloppy for braces that have wall thickness substantially less than 0.25 inch (6.4 mm), such as 1 inch (25.4 mm) diameter pipe. Thus in another way the clamp 12 solves the problem of providing a more snug fit for sway braces of small thickness.

[0050] A further advantage of the structure attachment fitting 10 is resistance to prying of bracket 14 attaching the fitting 10 to structure. The mounting bracket 14 incorporates additional material behind the attachment point specifically to help reduce the tendency of the bracket 14 to pry against the structure when loads are applied. In other structure attachment fittings there is considerably more material bearing against the structure to one side of the attachment hole compared to the other side. This leads to these brackets having a tendency to lift off and away from the structure.

[0051] Figs. 9 and 10 show an alternative embodiment, a structure attachment fitting 210. Many aspects of the structure attachment fitting 210 are similar, if not identical, to corresponding aspects of the structure attachment fitting 10 (Fig. 1). For example, a bracket 214 may be substantially identical in shape, form, and function to the bracket 14 (Fig. 1). A clamp 212 may be similar in overall configuration to the clamp 12 (Fig. 1), having an upper leg 222 and a lower leg 224 that extend from a main clamp body 226. The legs 222 and 224 define a slot 230 between them, in which a sway brace is inserted. A set screw 234 is threaded into a threaded hole 236 in the upper leg 222, and engages the sway brace material in the slot 230. The set screw 234 may interact with a step 256 on the lower leg 222 in a manner similar to the interaction between the set screw 34 (Fig. 1) and the step 56 (Fig. 1).

[0052] The slot 230 has a pair of slot sections 240 and 242 with different heights, able to handle different thicknesses of sway brace material. The outer slot section 240 has a substantially constant height between a lower surface 252 of the upper leg 222, and an upper surface 254 of the lower leg 224. The upper surface 254 is curved to allow better seating of a pipe on it. The inner slot section 242 is bounded by the lower leg upper surface 254 on the bottom of the slot section 242, and a

slanted surface 260 at the top of the slot section 242. The slanted surface 260 is a bottom surface of the upper leg 222. The slanted surface 260 is sloped relative to the upper leg lower surface 252, for example sloping downward at an angle of approximately 30 degrees toward the lower leg 224, although it will be appreciated that other angles are possible. The sloped surface 260 serves as a stop for insertion of thick objects inserted into the slot section 240, while letting thinner objects (such as pipe or strut sway brace material) pass at least partially into the slot section 242. The sloped or slanted surface 260 makes the inner slot section 242 tapered, with linearly-decreasing height along the length of the slot section 242. A rounded surface 264 at the closed end of the slot section 242 provides an absolute stop for insertion of objects into the slot section 242, no matter how thin.

[0053] Although the invention(s) has (have) been shown and described with respect to a certain preferred embodiment or embodiments, it is obvious that equivalent alterations and modifications will occur to others skilled in the art upon the reading and understanding of this specification and the annexed drawings. In particular regard to the various functions performed by the above described elements (components, assemblies, devices, compositions, etc.), the terms (including a reference to a "means") used to describe such elements are intended to correspond, unless otherwise indicated, to any element which performs the specified function of the described element (i.e., that is functionally equivalent), even though not structurally equivalent to the disclosed structure which performs the function in the herein illustrated exemplary embodiment or embodiments of the invention. In addition, while a particular feature of the invention may have been described above with respect to only one or more of several illustrated embodiments, such feature may be combined with one or more other features of the other embodiments, as may be desired and advantageous for any given or particular application.

CLAIMS

What is claimed is:

1. A seismic brace structure attachment fitting comprising:

a seismic brace clamp that includes:

a main body; and

an upper leg and a lower leg attached to the main body; and

a bracket pivotally coupled to the clamp;

wherein the upper leg and the lower leg define a slot therebetween; and

wherein the slot includes a pair of slot portions configured for receiving objects of different thickness.

2. The structure attachment fitting of claim 1,

wherein one of the slot portions has a substantially constant height over its length; and

wherein the other of the slot portions is tapered, having a height that changes over at least part of its length.

3. The structure attachment fitting of claim 1,wherein the slot portions having different respective heights.

4. The structure attachment fitting of claim 1,

wherein the clamp includes a set screw engaged in a threaded hole in the upper leg; and

wherein a tip of the set screw that is along an axis of the set screw may be moved into the slot by rotating the set screw, to engage and hold a sway brace in the slot.

5. The structure attachment fitting of claim 4, wherein the axis of the set screw is angled toward the main body, with the tip toward the main body.

6. The structure attachment fitting of claim 5, wherein the axis of the set screw is at an angle of 65 to 75 degrees relative to the slot.

7. The structure attachment fitting of claim 4, wherein the lower leg has a step on an upper surface.

8. The structure attachment fitting of claim 7, wherein the step is located along the upper surface within 0.2 inches (5.1 mm) of an axis of the set screw.

9. The structure attachment fitting of claim 7, wherein the step is closer to the main body than is where the axis is closest to the step.

10. The structure attachment fitting of claim 7, wherein the lower leg also has a rounded portion on the upper surface.

11. The structure attachment fitting of claim 10, wherein the rounded portion is a pipe-receiving surface.

12. The structure attachment fitting of claim 1, wherein the slot portions have respective stops.

13. The structure attachment fitting of claim 12,

wherein the slot portions include a relatively thin slot portion and a relatively thick slot portion; and

wherein the relatively thin slot portion that has a height that is less than a height of that of the relatively thick slot portion.

wherein the stop of the relatively thick slot portion is a curved surface on the upper leg that urges thin objects into the relatively thin slot portion.

14. The structure attachment fitting of claim 13, wherein the stop of the relatively thick slot portion is a slope wall of the relatively thin slot portion.

15. The structure attachment fitting of claim 1,

wherein the bracket includes:

a bracket body with a mounting hole; and

an arm attached to the bracket body at an obtuse angle to the bracket body; and

wherein the arm is coupled to the main body of the clamp using a fastener passing through holes in the arm and the main body.

16. The structure attachment fitting of claim 15,

wherein the bracket body includes a tab; and

wherein the tab and the arm are on opposite sides of the mounting hole in the bracket body.

17. The structure attachment fitting of claim 15, wherein a center of the clamp is substantially in line with an axis of the mounting hole in the bracket body.

18. A method of seismic bracing comprising:

attaching a seismic brace to a seismic brace clamp, wherein the attaching includes:

inserting the seismic brace into one of a pair of slot portions, configured for receiving objects of different thickness, between upper and lower legs of the seismic brace clamp; and

tightening a set screw against the seismic brace; and

coupling the seismic brace clamp to building structure, using a bracket that is pivotally coupled to the clamp.

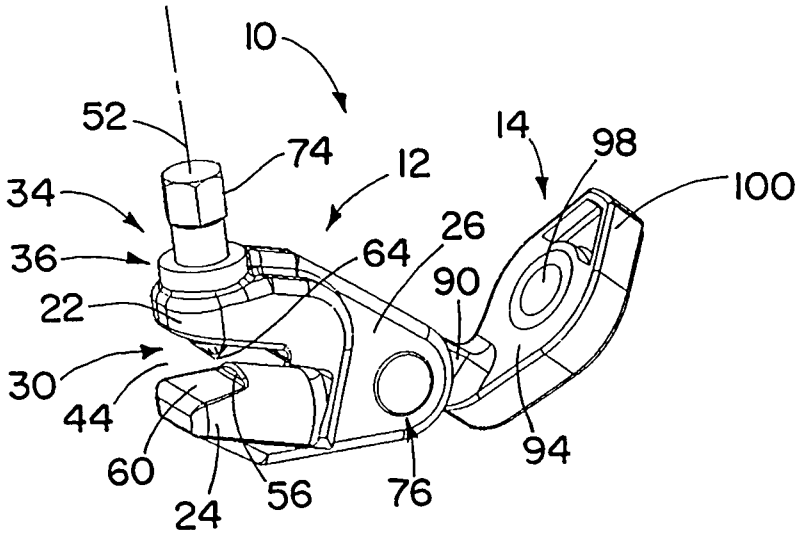

FIG. 1

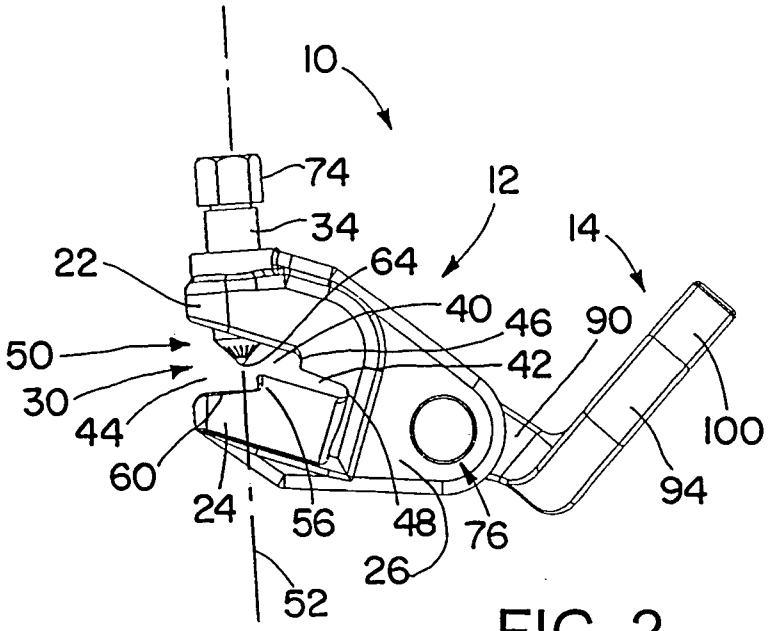

FIG. 2

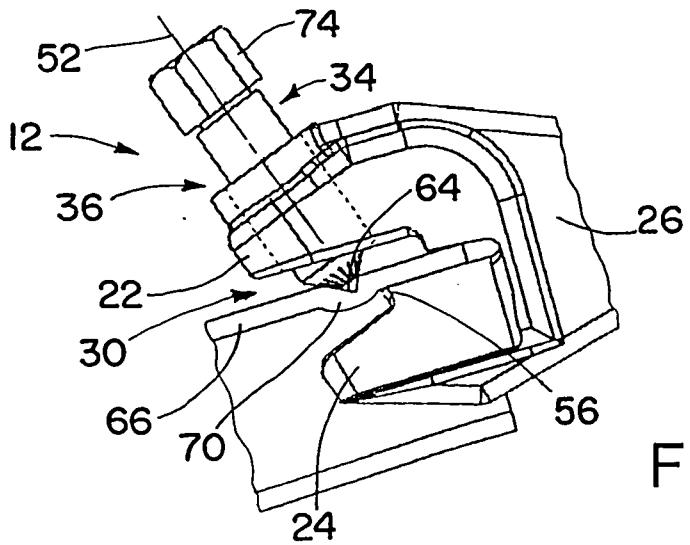

FIG. 3

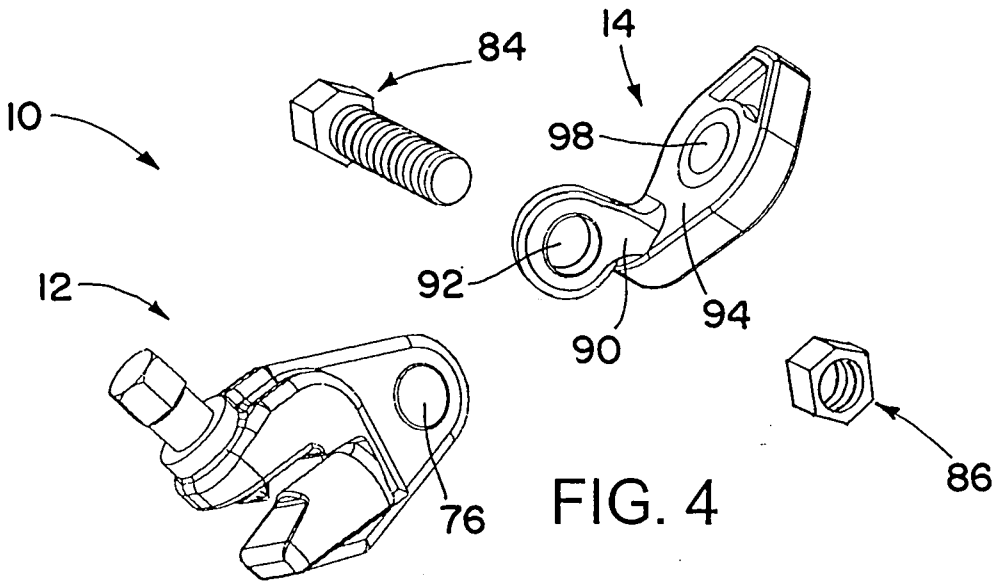

FIG. 4

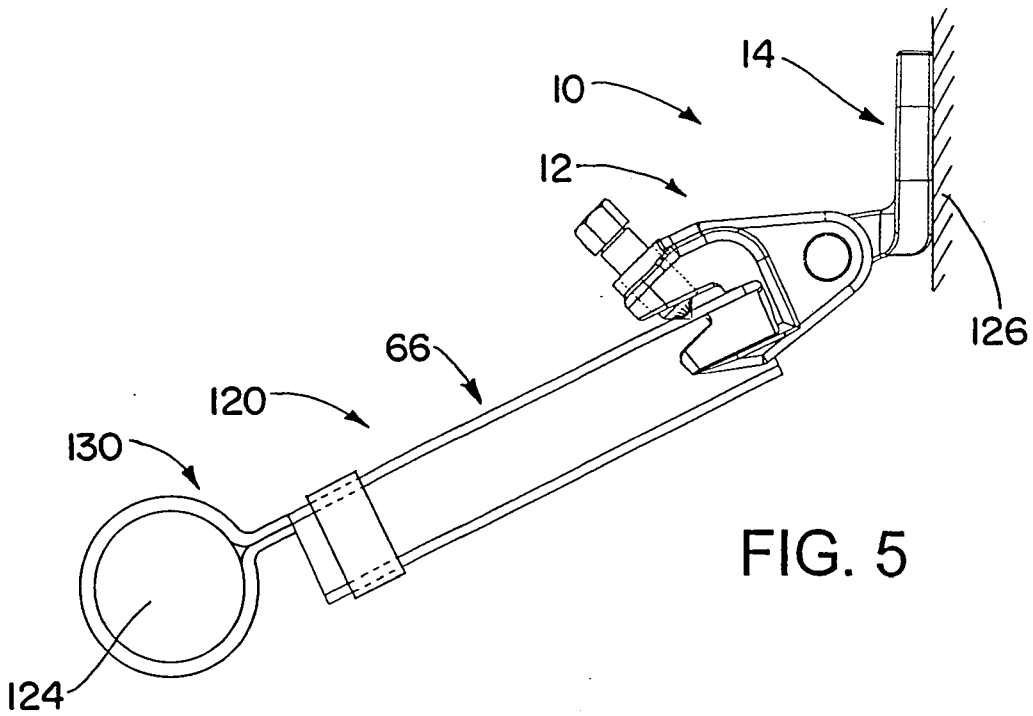

FIG. 5

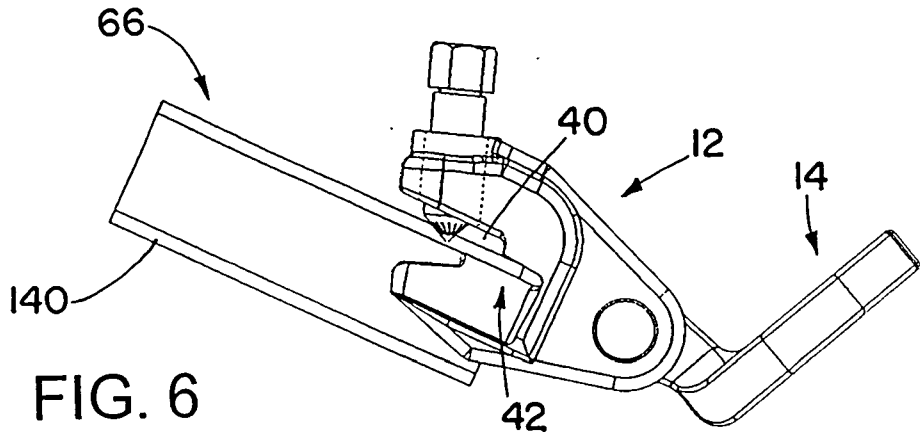

FIG. 6

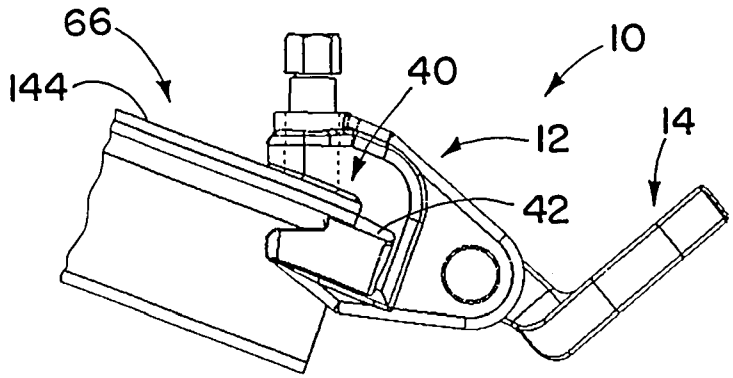

FIG. 7

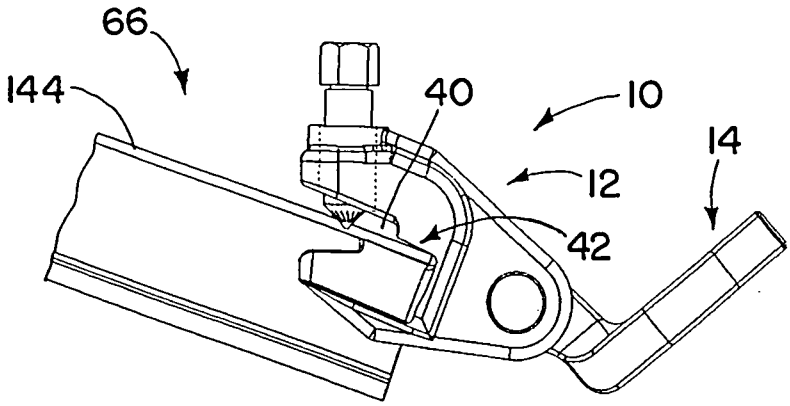

FIG. 8

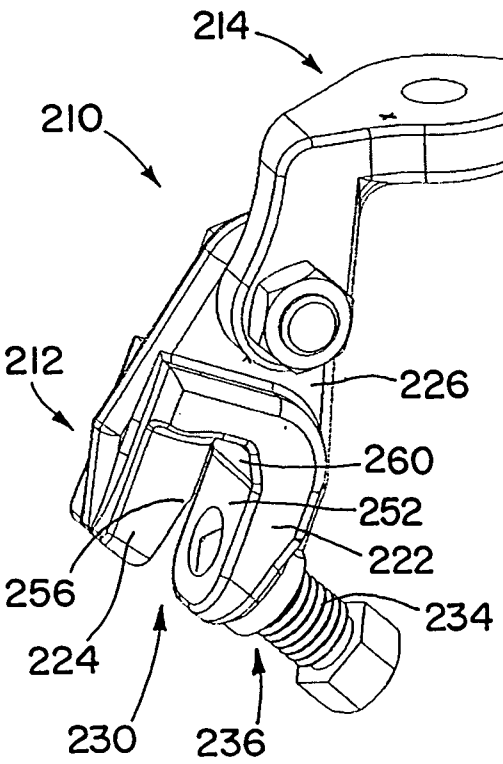

FIG. 9

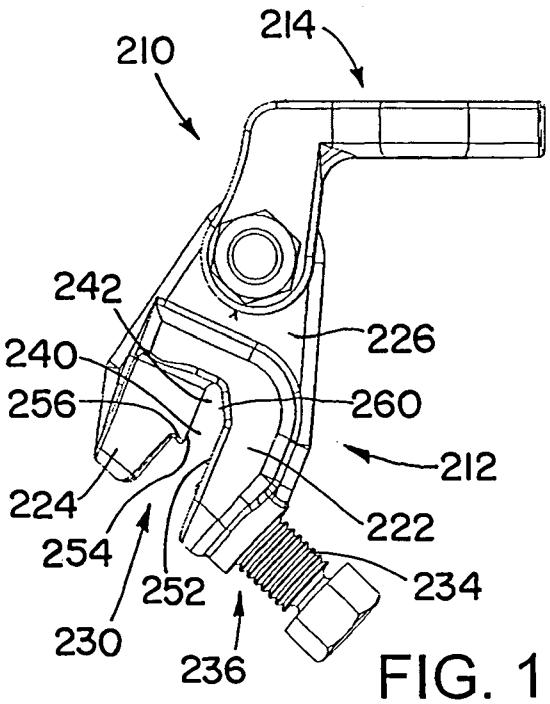

FIG. 10