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(54) **ADJUSTABLE BACKFLOW ENCLOSURE**

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(57) **ABSTRACT**

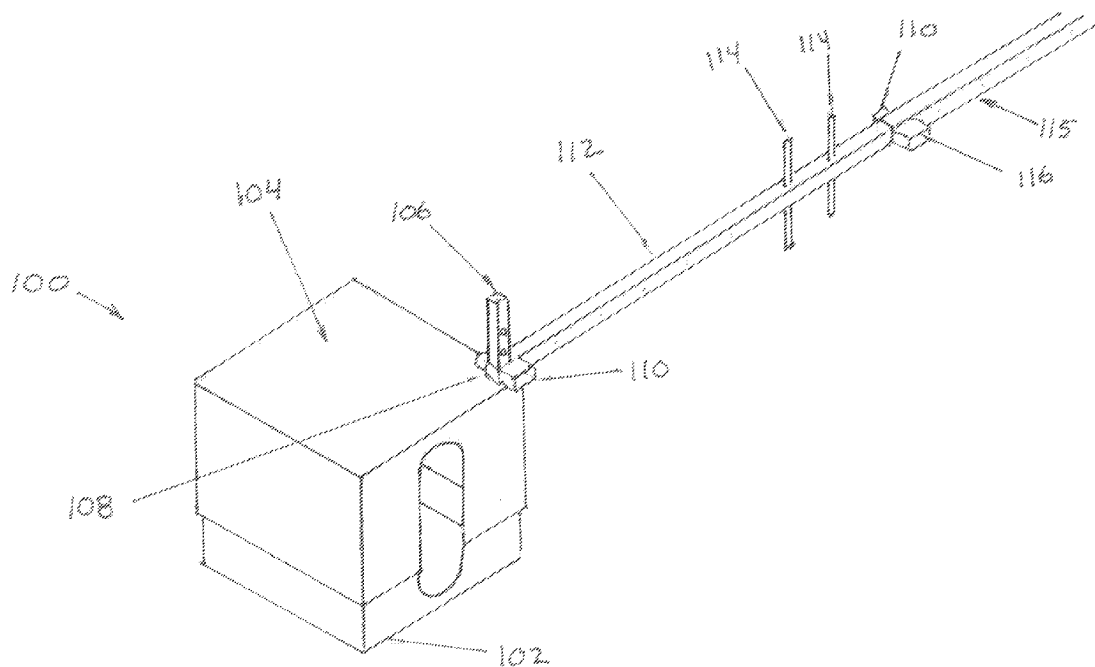
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Disclosed is an enclosure assembly having a first enclosure portion, a second enclosure portion and at least one at least one connector, wherein the first and second enclosure portions together form an enclosure and the at least one connector securely fastens the enclosure to a fixed object or foundation.



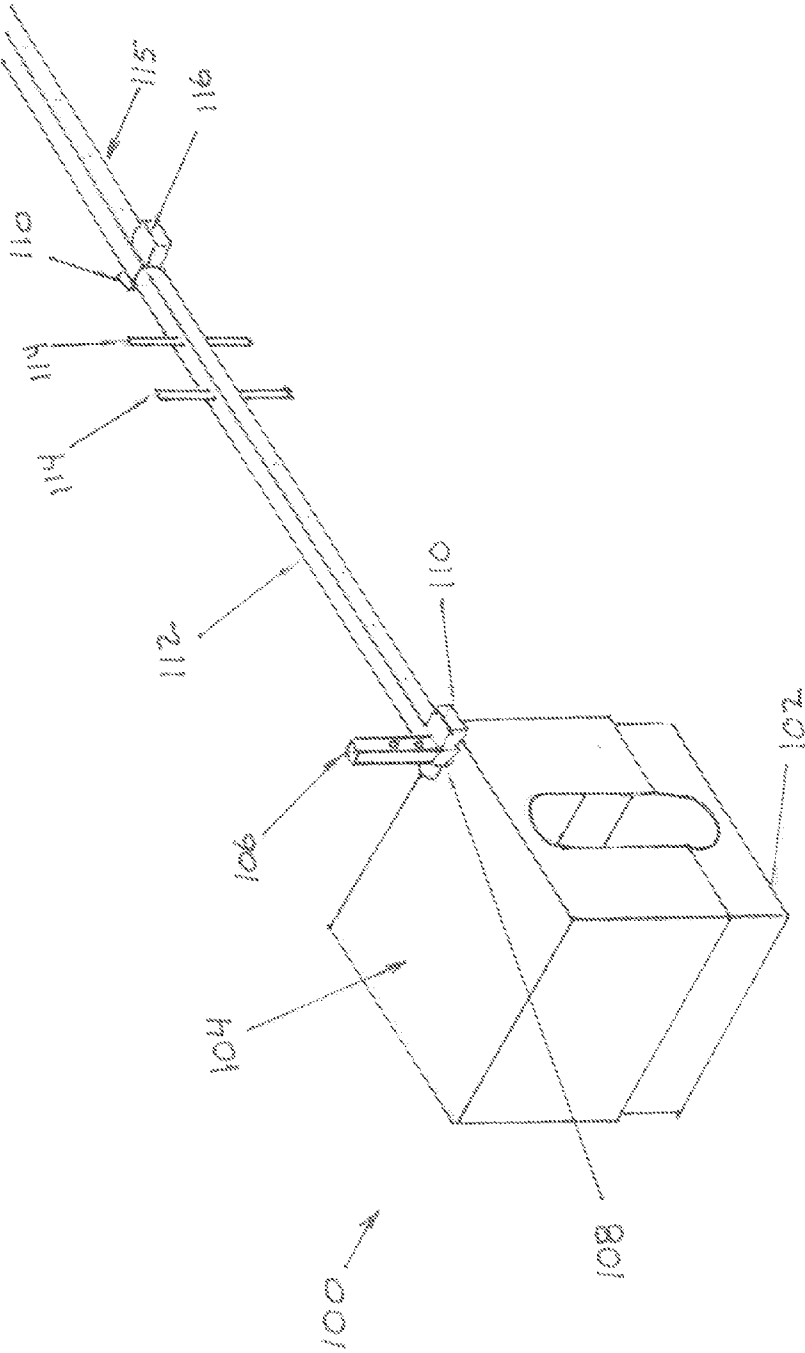


Figure 1

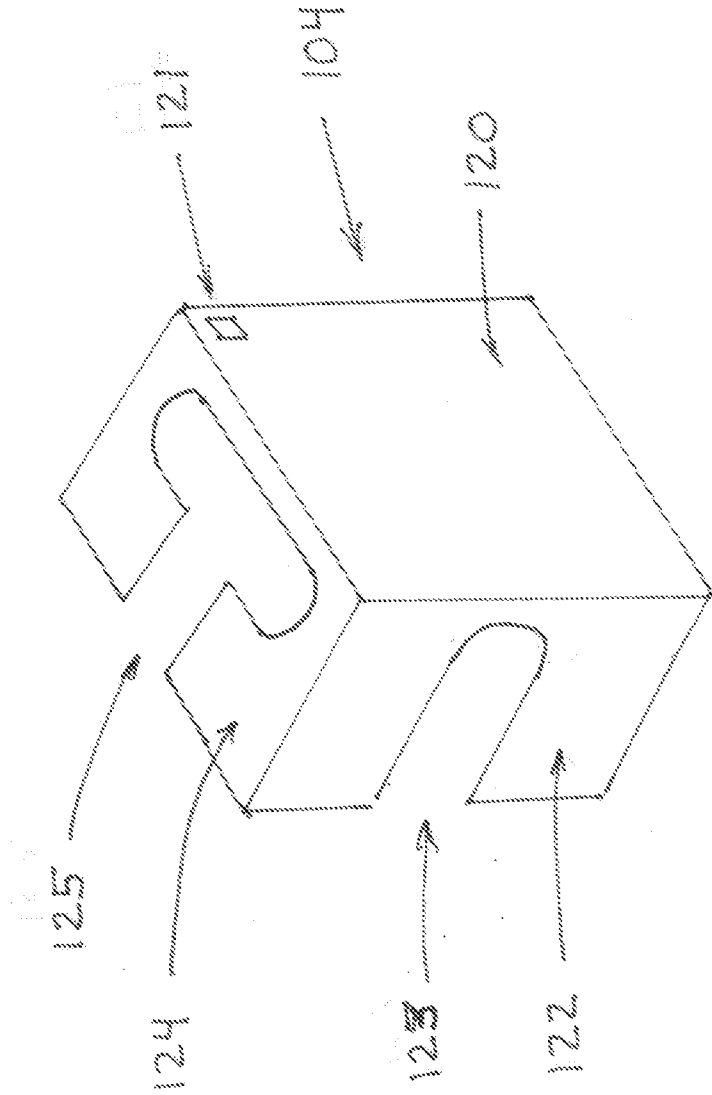


Figure 2

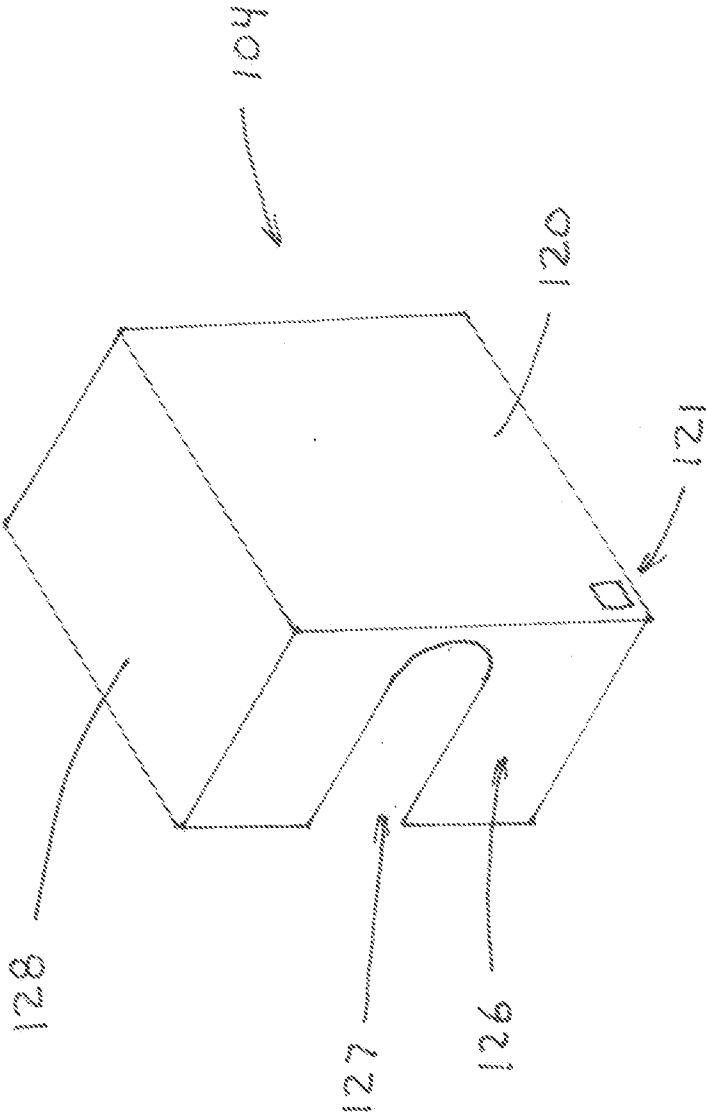


Figure 3

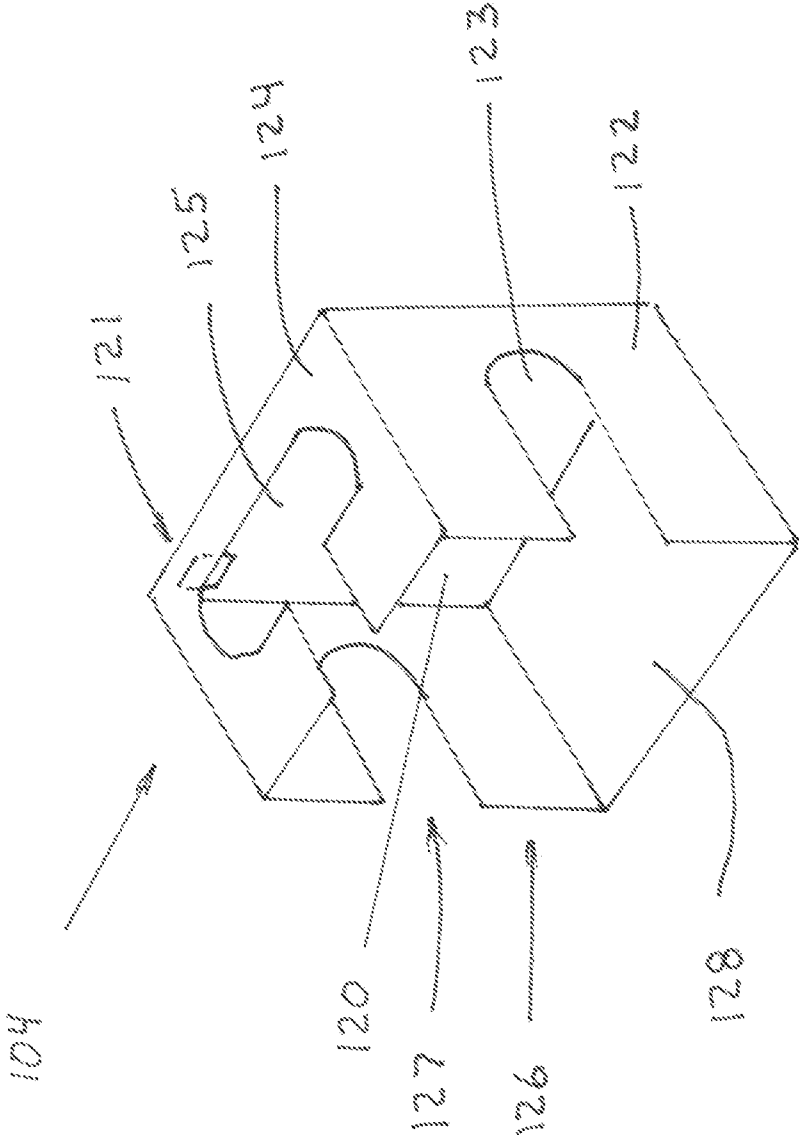


Figure 4

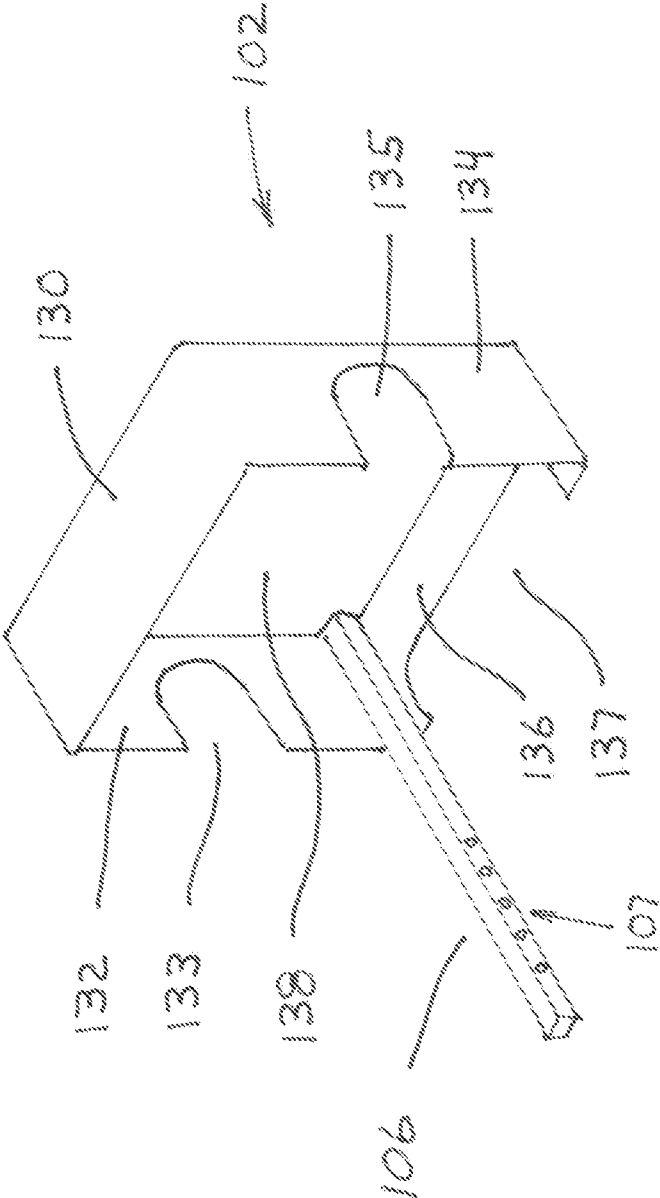


Figure 5

ADJUSTABLE BACKFLOW ENCLOSURE

FIELD

[0001] The present invention is generally related to enclosures for securing exposed piping and backflow assemblies. More specifically, the present invention is related to backflow assembly enclosures.

BACKGROUND

[0002] Backflow preventer security enclosures, or backflow enclosures, are security devices that are used primarily for the prevention of theft and vandalism of a backflow assembly. A backflow assembly, or backflow prevention assembly, is used to protect water supplies from contamination or pollution. In water supply systems, water is normally maintained under pressure to enable water flow. When pressure fails or is reduced, as may happen if a water main bursts, pipes freeze or there is unexpectedly high demand on the water system, contaminated water from the ground, from storage or from other sources may be drawn into the system. In order to prevent such an occurrence, regulations may require there to be an air gap or mechanical backflow prevention assembly between the delivery point of mains water and local storage or use.

[0003] These backflow assemblies contain components that include valves, piping, and other equipment. The valves, piping, etc. may be prone to theft since these component parts have value and are left in the open due to the assembly being constructed above ground. Protective enclosures are a very common part in the installation of a backflow assembly. These enclosures are typically constructed at ground level on a concrete slab on which the backflow preventer assembly rests. But when the backflow assembly is located at a height substantially above ground level, it is often impossible to enclose the assembly with a typical protective enclosure.

[0004] It would be desirable to have a security enclosure that can be used for backflow assemblies that are located at any height above ground level. It would also be desirable to have a system that can support the weight of the enclosure and secure the enclosure to the ground or some other permanent structure.

BRIEF DESCRIPTION OF DRAWINGS

[0005] FIG. 1 illustrates an embodiment of an adjustable backflow enclosure.

[0006] FIG. 2 illustrates a portion of an adjustable backflow enclosure in an embodiment of the present disclosure.

[0007] FIG. 3 illustrates a portion of an adjustable backflow enclosure in an embodiment of the present disclosure.

[0008] FIG. 4 illustrates a portion of an adjustable backflow enclosure in an embodiment of the present disclosure.

[0009] FIG. 5 illustrates a portion of an adjustable backflow enclosure in an embodiment of the present disclosure.

DETAILED DESCRIPTION

[0010] Disclosed herein is an adjustable backflow enclosure that may be used in a wide variety of backflow assemblies. In an embodiment, the adjustable backflow enclosure is of adjustable size that may be used in a wide variety of backflow assemblies. In an embodiment, the adjustable backflow enclosure contains a means for securing the enclosure to a fixed structure such as a foundation or to a building. The

means for securing the enclosure can include a connector element that extends from the enclosure to the foundation or other fixed structure.

[0011] Referring to the drawings, FIG. 1 depicts a side view of an embodiment of an adjustable backflow enclosure 100 having a first portion 102 and a second portion 104 wherein the first and second portions are in an engaged position wherein some of the first portion 102 is located within some of the second portion 104 which forms a six sided enclosure. In an embodiment, the second portion 104 is at least large enough to house at least a portion of the first portion 102. The engagement of the first and second portions can comprise a clamshell arrangement wherein the first portion 102 comprises an inner clamshell piece and the second portion 104 comprises an outer clamshell piece.

[0012] In an embodiment, an outer clamshell 104 may receive the inner clamshell 102 by closing over at least a portion of the inner clamshell 102 utilizing a hinge or other connection device (not shown) connected to the clamshell pieces.

[0013] As depicted in FIG. 1, the first portion 102 and the second portion 104 are positioned opposite of each other and at least some of the first portion 102 is positioned within at least some of the second portion 104 in a manner wherein the first portion 102 and the second portion 104 together form an enclosure. The first portion 102 contains a first connector 106 that extends from the first portion 102 and is able to protrude through an opening in the second portion 104. The first connector 106 is further shown as engaging with a second connector 112 at an opening 108 in the second connector 112. The first connector 106 and second connector 112 are shown as positioned in a perpendicular manner to each other, but other arrangements can vary the degree of angle at which the first connector 106 and second connector 112 are joined to suit a particular situation. The first connector 106, when fastened to the second connector 112, can act as a locking mechanism that links the first portion 102 and second portion 104 together and inhibits their separation. The first connector 106 and second connector 112 are shown as connected by a fastening mechanism 110 that projects through both the first connector 106 and second connector 112. The second connector can include anchor pins 114 that can be set into a cement support or foundation to secure the second connector 112 and thereby the entire enclosure. The second connector can include a second section 115, that can be connected to the second connector by the use of a second fastening connector 116 similar to the first connector 110. A pin or other locking mechanism 118 can be used in conjunction with the fastening connectors 110, 116. The second connector 112, or extensions to it, can be secured to a fixed structure such as a foundation, beam, pipe, etc. to secure the enclosure 110 and prohibit its removal, thus providing protection to the components contained within the enclosure.

[0014] FIG. 2 shows a side profile view of an embodiment of a second portion 104 that includes a base 120 a first side 122 and a second side 124. The base 120 contains an opening 121 that the first connector 106 of the first portion can protrude through. The first side 122 as depicted contains an opening 123 through which piping can protrude through when the enclosure 110 is placed over a piping backflow assembly. In the embodiment shown the opening 123 comprises a notch-shaped opening. The second side 124 as depicted contains an opening 125 through which piping can protrude through when the enclosure 100 is placed over a

pipng backflow assembly. In the embodiment shown the opening 125 comprises a T-shaped opening.

[0015] FIG. 3 shows a side profile view of an embodiment of a second portion 104 that includes a base 120 a third side 126 and a fourth side 128. The base 120 contains an opening 121 that the first connector 106 of the first portion can protrude through. The third side 126 as depicted contains an opening 127 through which piping can protrude through when the enclosure 100 is placed over a piping backflow assembly. In the embodiment shown the opening 127 comprises a notch-shaped opening. The fourth side 128 as depicted does not contain an opening.

[0016] FIG. 4 shows a side profile view of an embodiment of a second portion 104 that includes a base 120, first side 122 with opening 123, second side 124 with opening 125, third side 126 with opening 127 and fourth side 128. The base 120 contains an opening 121 that the first connector 106 of the first portion 102 can protrude through.

[0017] FIG. 5 shows a side profile view of an embodiment of a first portion 102 that includes a base 138, first side 134 with opening 135 shaped as a notch shaped opening, second side 136 with opening 137, third side 132 with opening 133 shaped as a notch shaped opening, and fourth side 130. A first connector 106 extends from the corner of the second side 136 and third side 132 and projects away from the base 138.

[0018] In the embodiment shown in FIGS. 1-5 the first portion 102 can engage with the second portion 104 such that the first connector 106 of the first section 102 will protrude through the opening 121 in the base 120 of the second portion 104. The first side 134 of the first portion 102 will fit within the first side 122 of the second portion 104 in a manner wherein the notch shaped opening in each will close around piping of the backflow assembly. The second side 136 of the first portion 102 will fit within the second side 124 of the second portion 102 wherein the sides 124, 136 will close around piping of the backflow assembly that may extend out in this direction. The third side 132 of the first portion 102 will fit within the third side 126 of the second portion 104 in a manner wherein the notch shaped opening in each will close around piping of the backflow assembly. The fourth side 130 of the first portion 102 will fit within the fourth side 128 of the second portion 104 to form a side of the enclosure 100 without any openings.

[0019] The percentage of the first portion 102 that can be within the second portion 104 can be adjusted to fit the particular arrangement of the backflow assembly. The first connector 106 as shown has perforations 107 positioned along its length. Some of the perforations 107 will be on the outside of the enclosure 100 when the first portion 102 and the second portion 104 are engaged. The fastening connector 110 can secure the first connector 106 so that the first portion 102 and second portion 104 are secured in place and not able to separate from each other. The fastening connector 110 further connects the first connector 106 with the second connector 112 to secure the enclosure 100 to a fixed object or foundation for security so that the entire assembly of the enclosure and connectors 106, 112 are secure.

[0020] The surfaces of the backflow enclosure may be constructed from or may contain sheet metal, expanded metal, metal grating, wire mesh, perforated metal, or any other desired material. In an embodiment the surfaces may contain

a solid material or may contain a portion that is solid and a portion that is perforated or a mesh type material. If constructed of a metal grating, wire mesh, or other non-solid material the first portion 102 and/or the second portion 104 may be supported by an inner frame or outer frame (not shown). The inner and/or outer frames may be constructed from any rigid material, including metal tubing or square metal tubing.

[0021] In an embodiment, the enclosure can be range from 10" to 100" in length, optionally from 20" to 80", optionally from 20" to 60", optionally from 24" to 50". In an embodiment the enclosure can have a width of from 10" to 60", optionally from 15" to 50", optionally from 20" to 40", optionally from 24" to 45". In an embodiment the enclosure can have a height of from 10" to 84", optionally from 15" to 60", optionally from 20" to 40", optionally from 24" to 45".

[0022] As used herein the term "adjustable backflow enclosure" is used to describe an enclosure that is capable of variable dimensions, such as a height that can be adjusted to be useful in a variety of applications. Alternate terms of use can include: backflow cover, backflow enclosure, backflow cage, valve cover, valve enclosure, valve enclosure, valve assembly cover, valve assembly enclosure, valve assembly cage, and the like.

[0023] It is to be understood that while illustrative embodiments have been depicted and described, modifications thereof can be made by one skilled in the art without departing from the spirit and scope of the disclosure. Depending on the context, all references herein to the "invention" may in some cases refer to certain specific embodiments only. In other cases it may refer to subject matter recited in one or more, but not necessarily all, of the claims. While the foregoing is directed to embodiments, versions and examples of the present invention, which are included to enable a person of ordinary skill in the art to make and use the inventions when the information in this patent is combined with available information and technology, the inventions are not limited to only these particular embodiments, versions and examples. Also, it is within the scope of this disclosure that the aspects and embodiments disclosed herein are usable and combinable with every other embodiment and/or aspect disclosed herein, and consequently, this disclosure is enabling for any and all combinations of the embodiments and/or aspects disclosed herein. Other and further embodiments, versions and examples of the invention may be devised without departing from the basic scope thereof and the scope thereof is determined by the claims that follow.

1. An enclosure assembly comprising:
 - a first enclosure portion comprising a base and a plurality of sides;
 - a second enclosure portion comprising a base and a plurality of sides;
 - at least one connector;
 - wherein the first and second enclosure portions together form an enclosure that can be securely fastened to a fixed object or foundation.
2. The enclosure assembly of claim 1, wherein the at least one connector securely fastens the first and second enclosure portions together.
3. The enclosure assembly of claim 1, wherein the enclosure has an adjustable dimension.
4. The enclosure assembly of claim 1, further comprising a support structure.

5. The enclosure assembly of claim 4, wherein the support structure is attached to a foundation or fixed object.

6. The enclosure assembly of claim 5, wherein the fixed object is selected from one of a pipe, beam, wall, floor, ceiling or railing.

7. The enclosure assembly of claim 1, wherein the first enclosure portion comprises at least one opening.

8. The enclosure assembly of claim 1, wherein the second enclosure portion comprises at least one opening.

9. The enclosure assembly of claim 1, wherein the first enclosure portion comprises at least one opening on two or more sides of the first enclosure portion.

10. The enclosure assembly of claim 1, wherein the second enclosure portion comprises at least one opening on two or more sides of the second enclosure portion.

11. The enclosure assembly of claim 1, wherein the first enclosure portion comprises at least one opening and the second enclosure portion comprises at least one opening and the openings enable the enclosure assembly to enclose around a piping assembly with piping projecting from the enclosure assembly through the openings.

12. The enclosure assembly of claim 1, wherein the first enclosure portion comprises at least one opening on the base.

13. The enclosure assembly of claim 1, wherein the second enclosure portion comprises a support structure that protrudes from an open front.

14. The enclosure assembly of claim 1, wherein the first enclosure portion comprises an opening on the base and the second enclosure portion comprises a support structure that protrudes from a second enclosure portion open front wherein the support structure projects through the opening on the first enclosure portion base.

15. The enclosure assembly of claim 1, wherein the first enclosure portion is smaller than the second enclosure portion and at least a portion of the first enclosure portion can fit inside the second enclosure portion.

16. The enclosure assembly of claim 15, wherein at least one dimension of the enclosure assembly can be adjusted by varying the amount of the first enclosure portion housed by the second enclosure portion.

17. The enclosure assembly of claim 1, wherein the surfaces of the first enclosure portion and the second enclosure portion are made from a material chosen from the group consisting of sheet metal, expanded metal, metal grating, wire mesh and perforated metal.

18. The enclosure assembly of claim 1, wherein at least a portion of the first or second enclosure portion is constructed with wire mesh and a frame.

19. A method of securing a piping assembly comprising: enclosing a piping assembly with an enclosure having a first enclosure portion, a second enclosure portion and at least one connector;

wherein the first and second enclosure portions together form the enclosure and the at least one connector securely fastens the first and second enclosure portions together; and

securely fastening the enclosure to a fixed object or foundation.

20. The method of claim 19, wherein the enclosure is connected to a support structure and the support structure is attached to a foundation or fixed object.

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