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Goodson

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(54) **APPARATUS AND METHOD FOR A PLUMBING CONNECTOR**

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(51) **Int. Cl.**

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H01R 4/56 (2006.01)
H01R 11/09 (2006.01)

(52) **U.S. Cl.**

CPC **F16L 25/01** (2013.01); **H01R 4/66** (2013.01); **H01R 4/36** (2013.01); **H01R 4/56** (2013.01); **H01R 11/09** (2013.01)

(58) **Field of Classification Search**

CPC H01R 13/648; F16L 25/01
USPC 361/215
See application file for complete search history.

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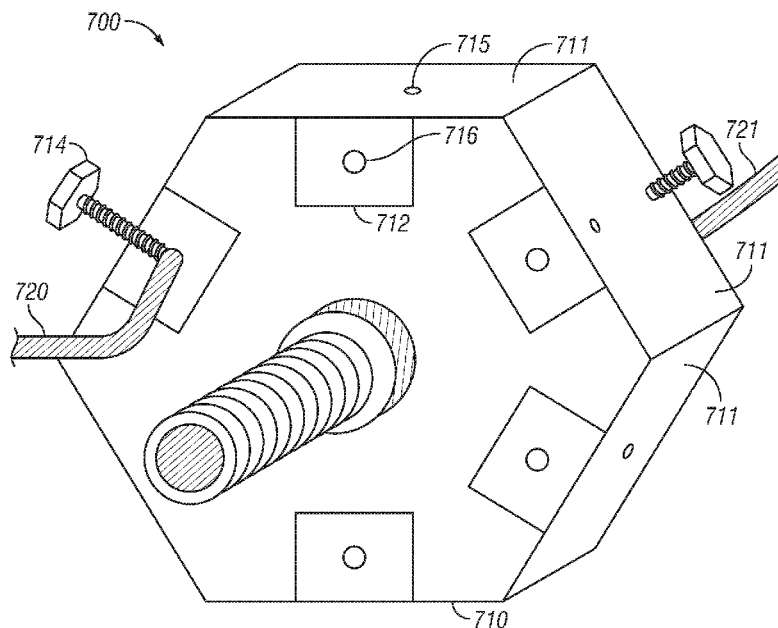
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(57) **ABSTRACT**

The present invention provides an apparatus for a threaded plumbing connector to electrically ground pipes. The apparatus includes wire terminal block(s), connecting the threaded plumbing connector body to a wire or other conductive material. In the event that a pipe becomes electrically energized, the grounding connection of the threaded plumbing connector would be able to shunt the electrical current away from the pipes and reduce the risk of fire.

30 Claims, 10 Drawing Sheets



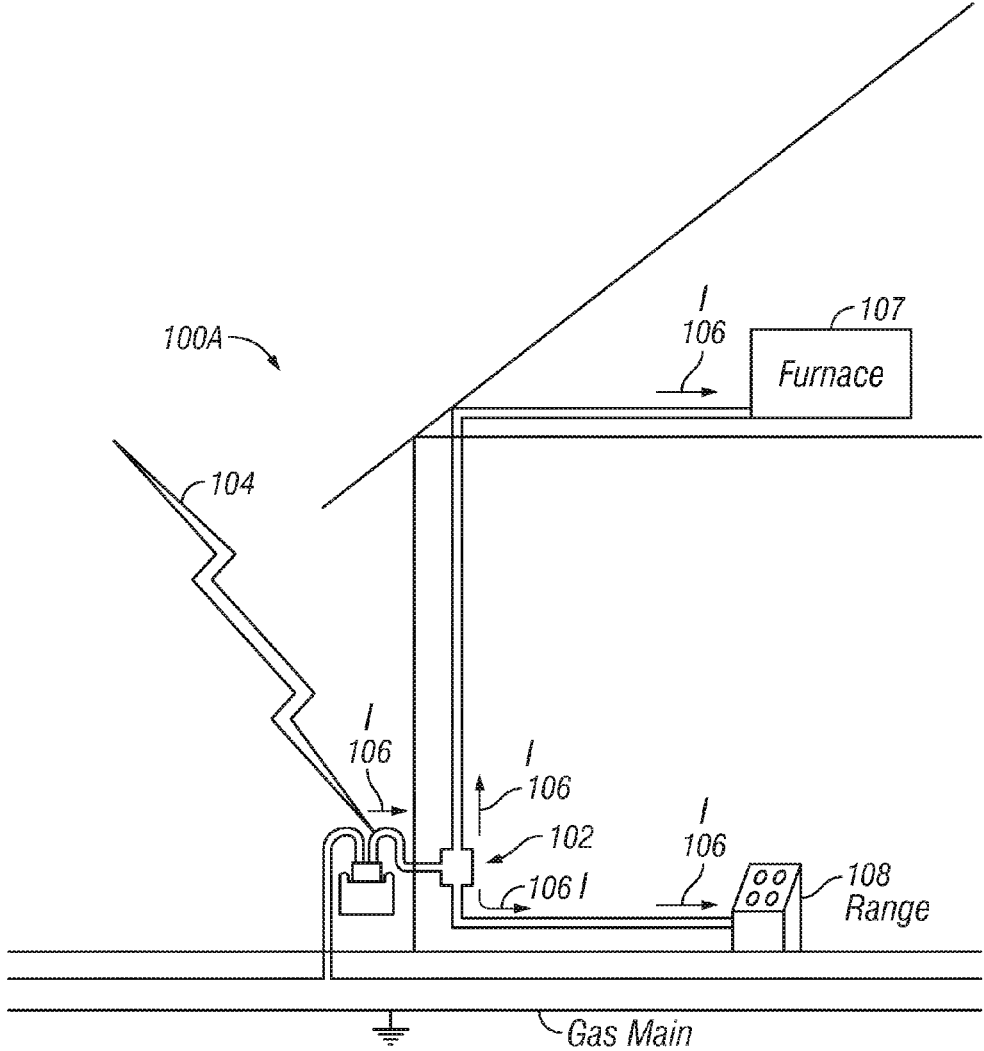


FIG. 1A

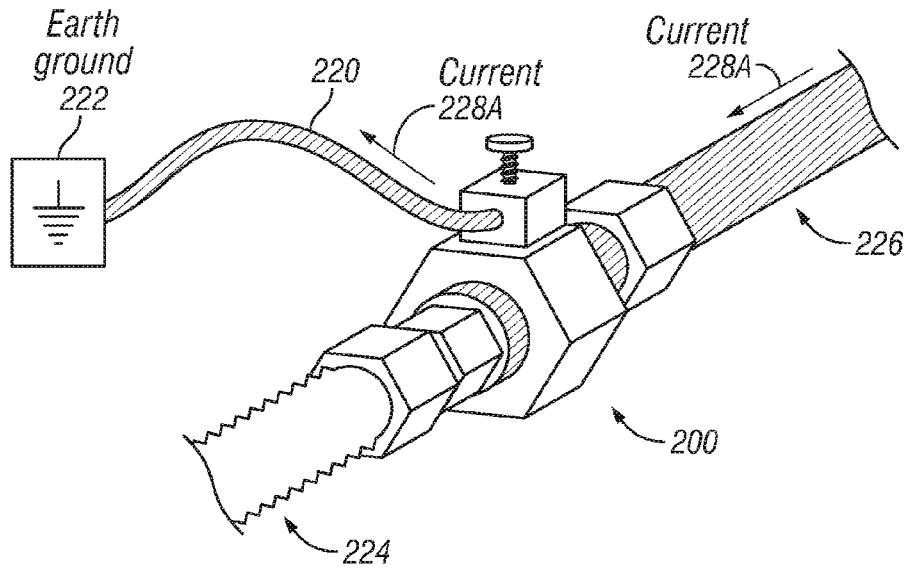


FIG. 2A

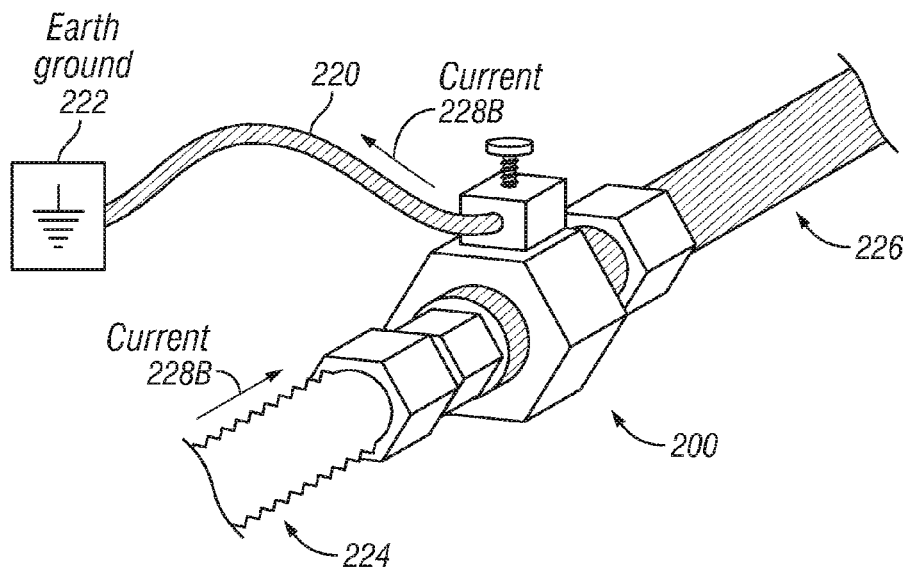


FIG. 2B

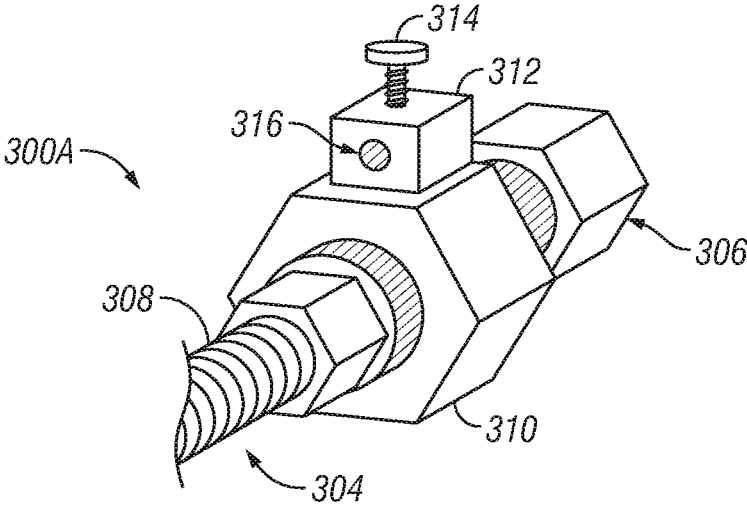


FIG. 3A

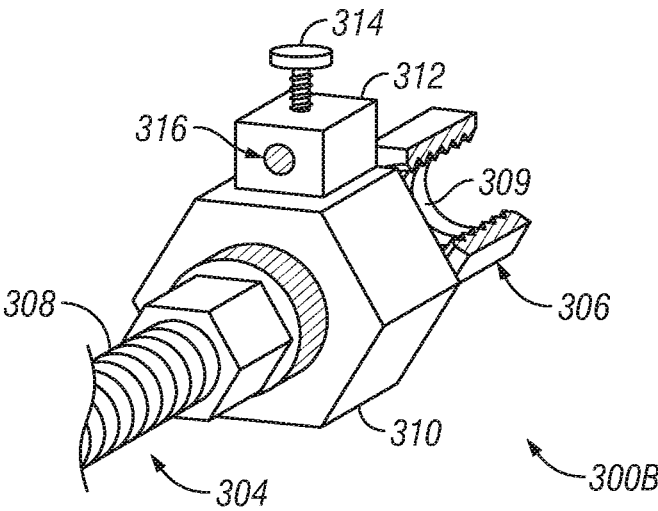


FIG. 3B

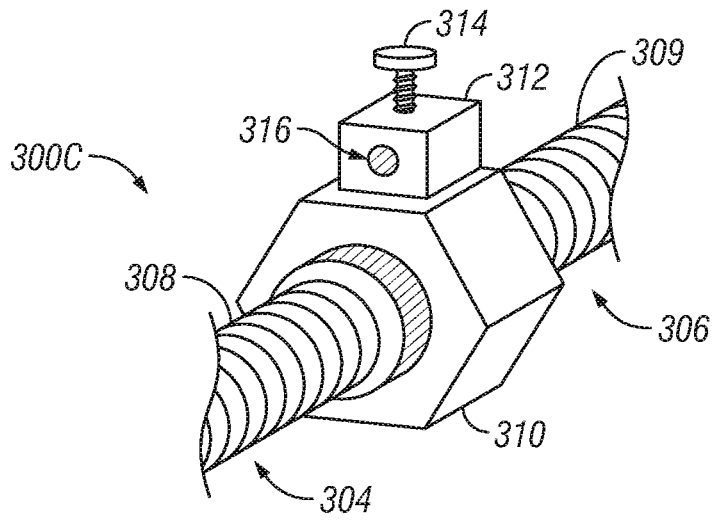


FIG. 3C

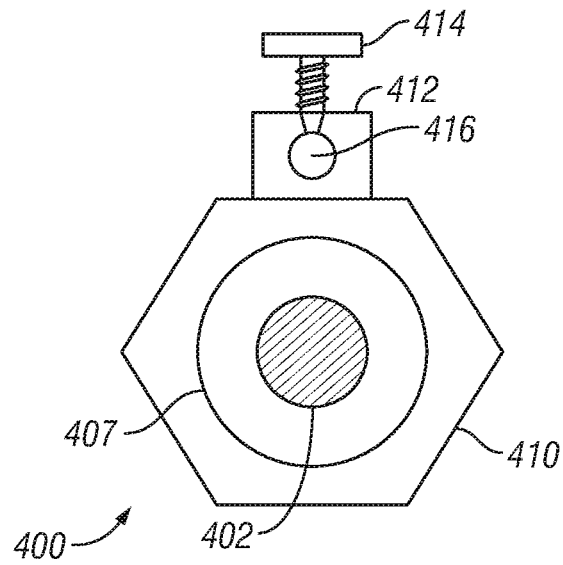


FIG. 4

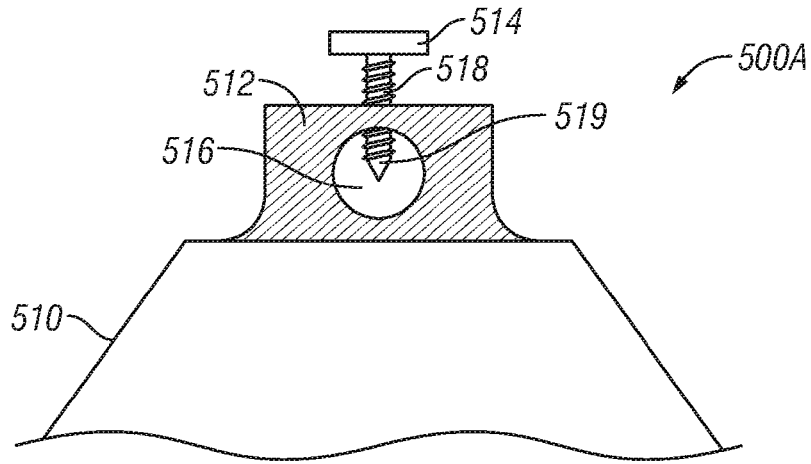


FIG. 5A

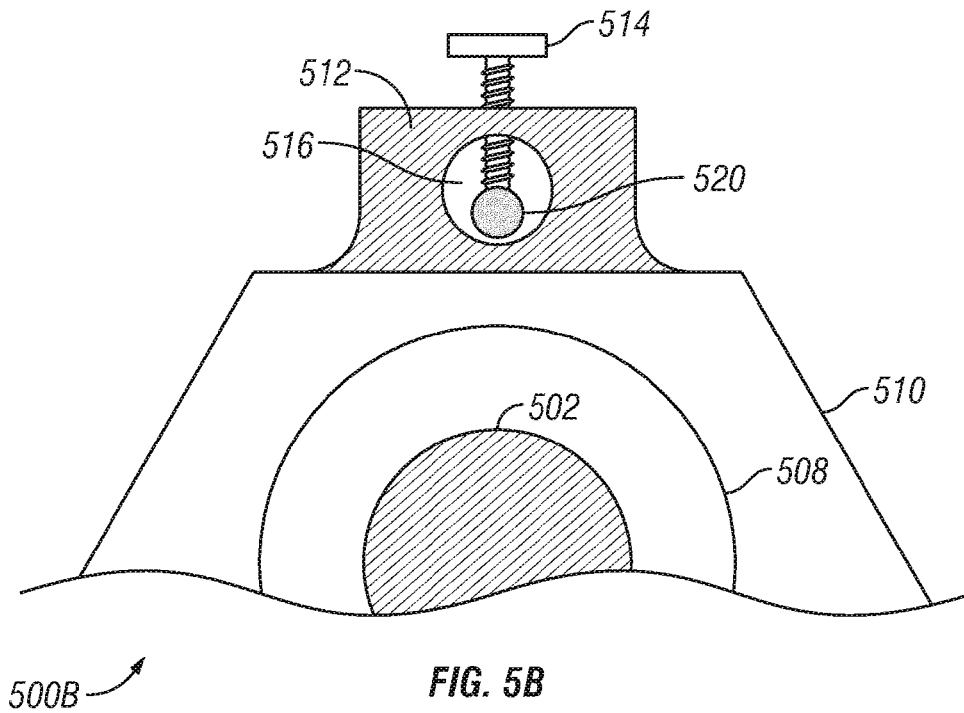


FIG. 5B

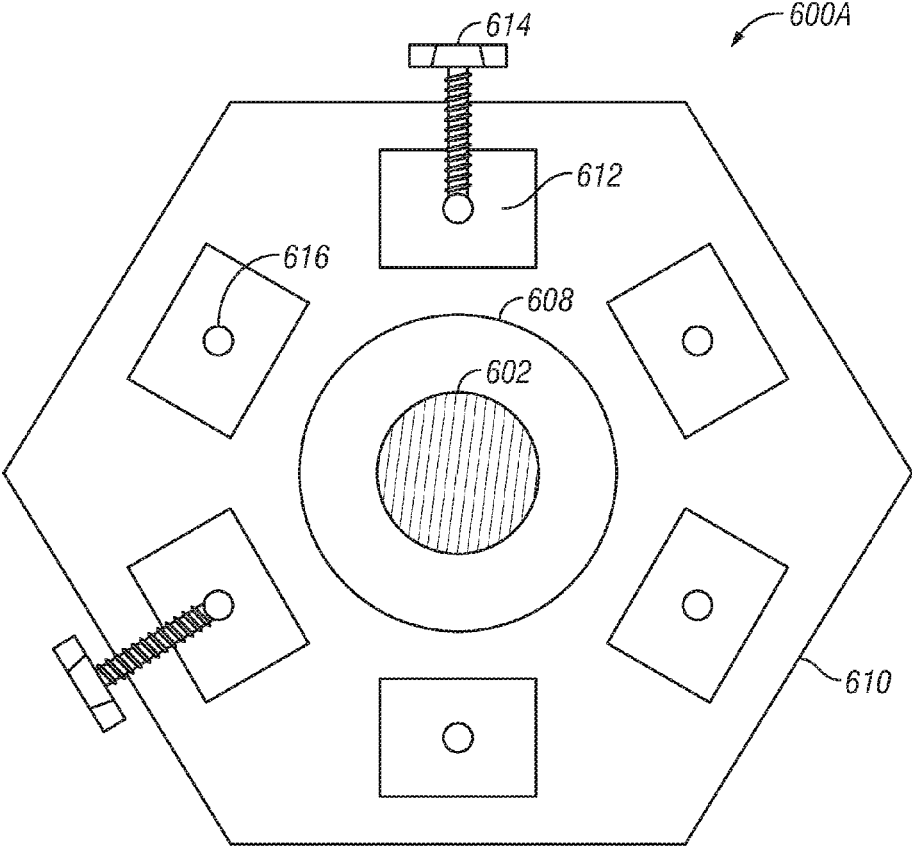


FIG. 6A

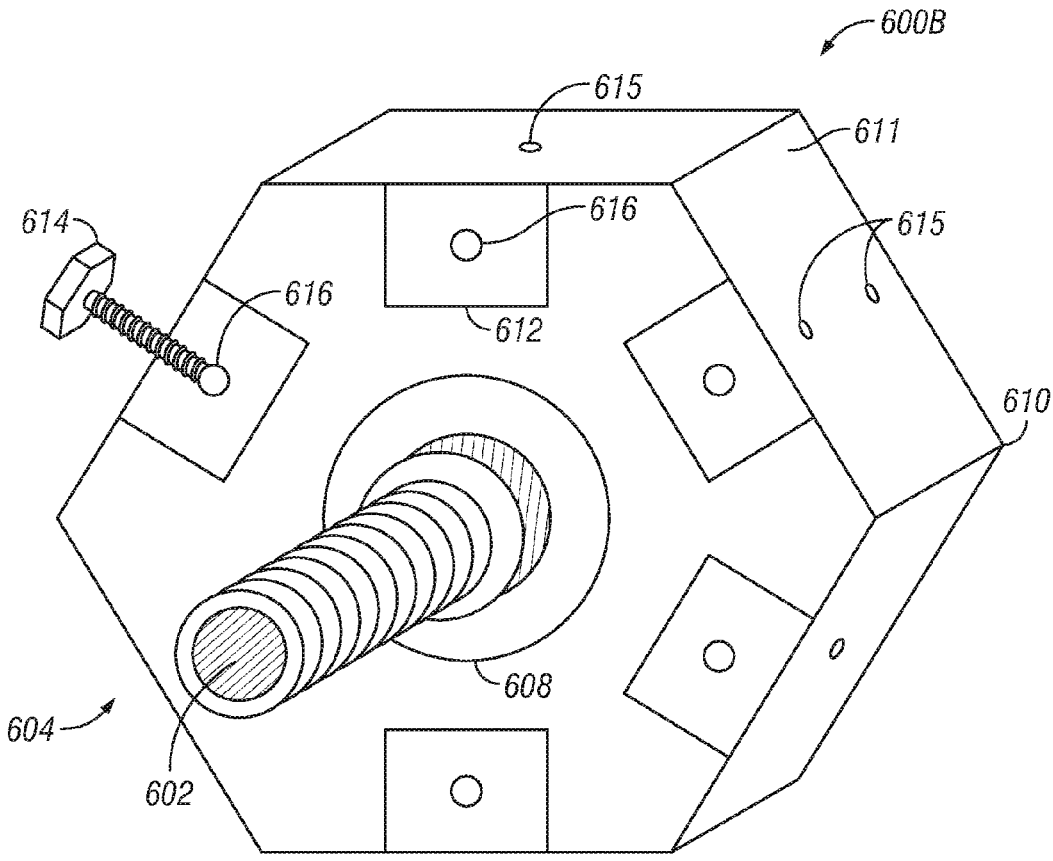


FIG. 6B

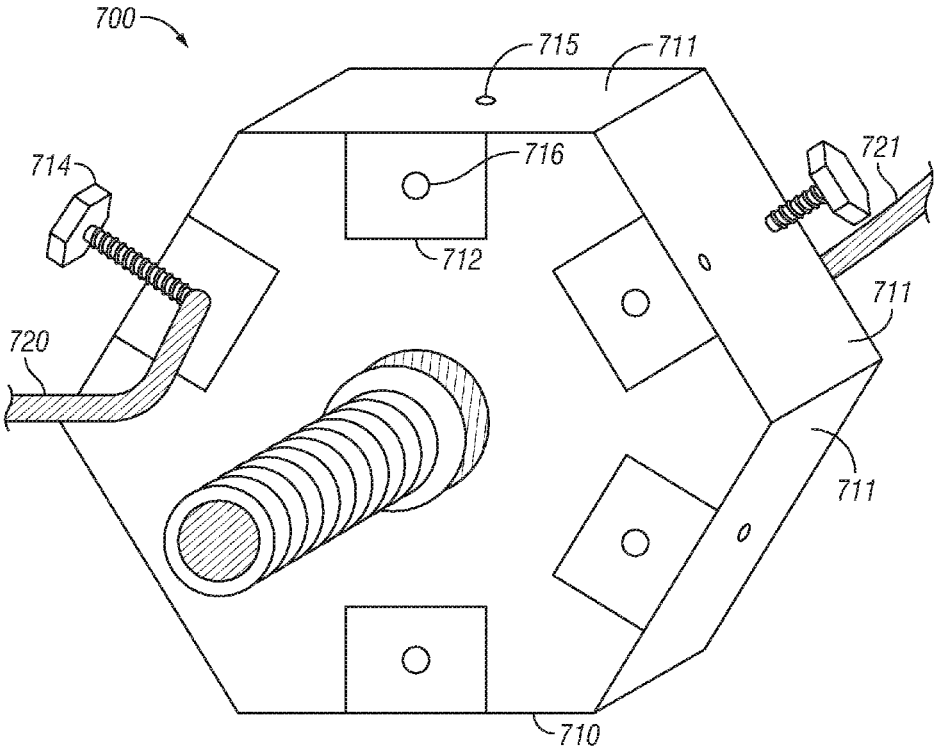


FIG. 7

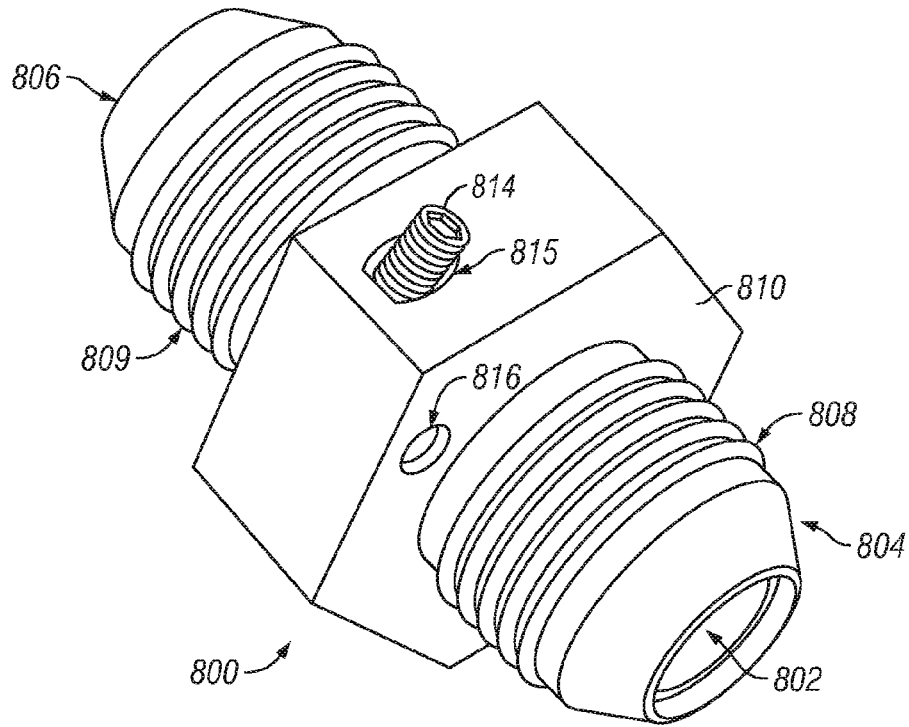


FIG. 8A

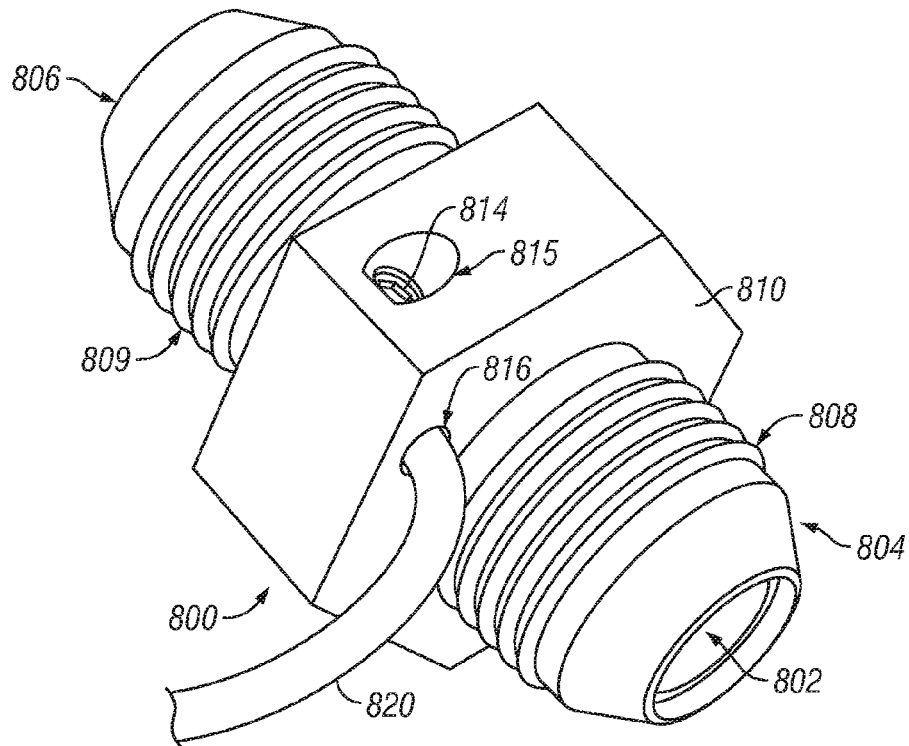


FIG. 8B

APPARATUS AND METHOD FOR A PLUMBING CONNECTOR

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation in part of U.S. application Ser. No. 15/414,833, filed Jan. 25, 2017, which claims the benefit of U.S. Provisional Application No. 62/287,327, filed Jan. 26, 2016, the disclosure of which is fully incorporated herein by reference.

BACKGROUND

1. Field of the Disclosure

The present invention relates generally to the prevention of fires caused by electrical energy and more specifically to fires involving gas leaks at the fittings and junctions between gas lines or other plumbing connections.

2. Background

In a world that relies on electronics and electrical systems, providing a reliable ground throughout a building is critical. A reliable ground connection is especially critical for static electricity buildup along gas pipelines. While, some buildings use their plumbing systems to provide one path for non-critical grounding, other buildings do not have any ground connection for their plumbing fixtures. Moreover, due to plumbing fittings requiring Teflon tape or plumbers putty to properly fit the plumbing connection, the conductivity between two pipes can be further reduced. Materials such as, Teflon tape and plumbers putty are low conductivity materials, preventing them from transferring an electric current from one pipe to the next.

Enter Corrugated Stainless Steel Tubing (CSST), a corrugated pipe that is flexible and in most cases easier to install over traditional black iron pipe. With sizes ranging from one-half of an inch up to two inches, CSST is one of the most popular pipes for residential gas lines. There is a drawback of the corrugated nature of CSST. Its thin walls cause it to have a propensity to fail in lightning storms, allowing the escape of fuel gas. An arc to the CSST surface can develop, and this arc can result in the CSST being punctured, and thus creating a high fire risk situation. To help reduce the risks of electrical energy from storms puncturing CSST, the National Fuel Gas Code now requires a so called "direct bond" to the CSST piping; the bond wire is a heavy gauge bond wire, and is connected to the building grounding system.

On some piping systems, a jumper wire is used to jump or connect the ground from one pipe material to a different pipe material. The current method of attaching a jumper wire to the pipe requires attaching a screw on clamp to the pipe. To ensure a solid connection any paint or other non-metallic material on the outer surface of the pipe must be removed. Additional problems have been created with the introduction of CSST. The grooves along the outer surface of CSST, that aid in the flexibility of the pipe, also reduce the available surface area for unshielded CSST pipes. Some CSST installers address this issue by placing the clamp around a pipe junction. However, employing the clamp around the pipe-fitting still creates an issue of minimal surface area. This creates a problem with traditional clamps because the physical connection can be lost when the clamp loosens even the slightest amount and the minimal surface area is lost.

BRIEF SUMMARY

In accordance with one embodiment, a threaded plumbing connector is presented. The threaded plumbing connector

allows a bonding wire to be connected to the grounding system without the use of the traditional bonding clamp.

In accordance with one aspect of the present invention, an apparatus for a threaded plumbing connector includes a hollow passage body, a first threaded end, a second threaded end, a geometric outer body surface between the two threaded ends, and a wire terminal block. The wire terminal block allows the attachment of a conductive wire, to shunt electrical current away from the plumbing connector.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1A shows a house without gas line protection struck by lightning.

FIG. 1B shows a house with the plumbing fitting gas line protection struck by lightning.

FIG. 2A illustrates the plumbing connector in operation with current traveling along a black iron pipe.

FIG. 2B illustrates the plumbing connector in operation with current traveling along a CSST pipe.

FIG. 3A shows a perspective view of the plumbing connector with CSST ready to attach and a first male end and a second female end.

FIG. 3B shows a perspective view of the plumbing connector with a cut away view of the second female end.

FIG. 3C shows a perspective view of the plumbing connector with a first and second male ends.

FIG. 4 illustrates a cross-sectional end view of the plumbing connector.

FIG. 5A shows an inset view of the wire terminal block.

FIG. 5B shows an inset view of the wire terminal block, with the set screw connecting a wire conductor to the wire block.

FIG. 6A illustrates a cross-sectional end view of a plumbing connector with a plurality of wire terminal blocks.

FIG. 6B shows a perspective view of the plumbing connector with a plurality of wire terminal blocks.

FIG. 7 illustrates the plumbing connector with a plurality of wire terminal blocks in operation.

FIG. 8A illustrates the plumbing connector with an offset wire terminal connection.

FIG. 8B shows the plumbing connector with an offset wire terminal connector connected to a wire.

DETAILED DESCRIPTION

The present disclosure describes a threaded plumbing connector. Such a threaded plumbing connector creates an interface between two different fluid lines or pipes, and provides an electrical terminal connection to shunt away unwanted current. In particular, for gas lines, employing the threaded plumbing connector reduces the fire risk, resulting from high electrical current traveling along the gas line. For example, a high current spike from a lightning strike or a short in an electrical power system.

FIG. 1A shows a house **100A** that has been struck by lightning **104** that did not have grounding protection for its gas line system **102**. The current from the lightning strike **106** can travel along the entire gas line system **102**. This current **106** is a major fire risk, and is especially dangerous if there are any junction failures. High currents can arc (jump) across these failures creating a spark that can be the source of ignition for a devastating fire. Additionally there is risk to appliances such as a furnace **107** or a range **108**.

In FIG. 1B the gas system **102** of a house **100B**, is outfitted with the threaded plumbing connector **110**. The threaded plumbing connector **110** creates a low resistance,

high conductivity interface between pipes, including pipes of different materials. The low resistance and high conductivity allow the threaded plumbing connector **110**, in conjunction with a conductive wire **112** to shunt current away from the pipes to a building ground. Not only does shunting reduce the risk of fire in the gas system **102**, it also protects appliances from high currents as well (see furnace **107** or range **108**).

FIGS. **2A** and **2B** illustrate the threaded plumbing connector **200** in operation as the junction between a CSST pipe **224** and a black iron pipe **226**. A high current is introduced along the pipes by some event, such as inadvertent energization by household current. Utilizing the threaded plumbing connector **200** can prevent the current from passing to a second pipe from a first pipe. In FIG. **2A** the current **228A** is traveling towards the threaded plumbing connector **200** along the black iron pipe **226**, and potentially traveling to the CSST pipe **224**. Similarly in FIG. **2B** the current **228B** travels along the CSST pipe **224** towards the threaded plumbing connector **200**. However, in both illustrations the threaded plumbing connector **200** connects via a wire **20** to the earth ground **222** of the building. The wire **220** to earth ground **222** provides a shunt to direct the current **228** away from the CSST pipe **224** or black iron pipe **226**. In some cases the threaded plumbing connector **200** will be connected to the black iron pipe **226** through a traditional grounding clamp, however, the present invention in an exemplary embodiment is designed to prevent the requirement of this extra piece to create a ground connection.

FIG. **3A-3C** shows a perspective view of a threaded plumbing connector **300A**, **300B**, **300C**. Fluid can pass through the threaded plumbing connector **300A**, **300B**, **300C**, via the center of the hollow cylinder (not shown). The hollow cylinder is threaded on each end (**304**, **306**), in order to fasten the hollow cylinder to a pipe (not shown), creating a first threaded end **304** and a second threaded end **306**. Each of these threaded ends **304** and **306**, also has their own unique thread pattern. The first threaded end **304** corresponds to a first thread pattern **308**, and the second threaded end **306**, corresponds to a second thread pattern **309**. Between the first threaded end **304**, and the second threaded end **306**, is a protruded section **310** along the outer surface of the hollow cylinder. Attached to one section of the protruded section **310**, is a wire terminal block **312**. In the embodiment disclosed in **3A-3C**, the wire terminal block **312**, also includes a set screw **314**. The terminal block **312**, also has a feedthrough **316** for accepting a wire or other conductive material that the set screw **314** will secure in the feedthrough **316**.

The set screw **314** ensures a connection between the wire terminal block **312** and a conductive material such as a wire that is within the feedthrough **316**. However, the combination of the feedthrough **316**, the set screw **314**, and the wire terminal block **312** could alternatively be comprised of, for example, a spring-loaded terminal or a pressure fit terminal. In addition, the terminal block **312** could be formed as one continuous piece with the threaded plumbing connector **300A**, **300B**, **300C**, or affixed to the protruded section **310** through a conductive material. The cross-section shape of the protruded section **310** in the preferred embodiment would be hexagonal. However, the shape is not exclusive, for example the cross section of the protruded section **310**, could also be a square, rectangle, or oval, or any other shape. Additionally the protruded section **310** could comprise multiple sections with each, having its own cross section shape. For example, a first protruded section having a first hexagon cross section, followed by a larger second protruded section

310 having a second hexagon cross section with the wire terminal block **312** attached, and finally a third protruded section that matches the cross section of the first protruded section.

In order to allow the wire terminal block **312**, to transfer electrical current along a conductive material, the threaded plumbing connector **300A**, **300B**, **300C**, should be made of an electrical conducting material. Alternatively, the threaded ends (**304** and **306**), and the wire terminal block **312** can be made of different electrically conductive materials to facilitate the transfer of electrical current from the threaded ends (**304** and **306**) to the wire terminal block **312**. For example, the wire terminal block **312** would have a higher conductivity and lower resistance, than the threaded ends (**304** and **306**). The present invention is not limited, to being wholly made of an electrical conducting material, for example, if only the outer surface of the protruded section **310**, the first threaded end **304** and the second threaded end **306** are made of an electrical conductive material the protection of the pipes can still be achieved. These pipes are the means for transferring fluid from a supply source (not shown) to a utilizing device, such as a water heater or furnace. To provide efficient fluid flow the shape and diameter of the hollow cylinder (not shown), can also be matched to the shape and diameter of the first and second pipe to provide an efficient transfer of fluid.

The first threaded end **304**, and the second threaded end **306**, provide the interface to shunt electrical current away from the fluid pipes, through the threaded pipe connector **300A**, **300B**, **300C** and out through the wire terminal block **312**, and the attached conductive material. The available surface area provided by the first threaded end **304**, and the second threaded end **306**, allow electrical current to be shunted away from fluid pipes; this is an important improvement over the current art. The available surface area is critical for the transferability of current away from the pipes. The first threaded end **304** can also have a first thread pattern **308**. The matching of the first thread pattern **308**, to that of the first pipe (not shown) is crucial to the effectiveness of the current shunting. This interface of materials is key to shunting current through the threaded pipe connector **300A**, **300B**, **300C** and out through the wire terminal block **312**. The first threaded end **304** and the second threaded end **306** can include for example, flared fittings that reduce the need of Teflon tape, or plumbers putty to prevent leaks. This also increases the ability of threaded plumbing connector **300A**, **300B**, **300C** to transfer electrical current efficiently because neither of these materials have a high conductivity. Similarly, the second threaded end **306** also has a second thread pattern **309**, matching with the thread pattern of a second pipe (not shown), in order to shunt current through the threaded pipe connector **300A**, **300B**, **300C**, and out through the wire terminal block **312**.

FIG. **4** illustrates a cross sectional end view of the threaded plumbing fitting **400**. At the center of FIG. **4**, is the hollow cylinder **402**, for the transfer of the fluid from the first threaded end **304**, to the second threaded end **306**, or alternatively from the second threaded end **306** to the first threaded end **304**. The thread pattern **407**, of either the first thread pattern **308** of the first threaded end **304**, or the second thread pattern **309** of the second threaded end **306** can be seen outside the hollow cylinder **402**. The shape of the protruded section **410** can include a hexagonal shape, but it is not limited to this embodiment. For example, it could be a square, an oval, or rectangle, or any other polygon cross section that would allow a person to utilize a tool to affix the threaded plumbing fitting **400** to a pipe.

On one edge of the protruded section **410**, is the wire terminal block **412**. Through the center of a terminal block **412**, is the feedthrough **416**. The feedthrough **416** and set screw **414** allow for a connection between the wire terminal block **412** and the conductive material, such as a wire. The set screw **414** provides an adjustable fastener to lock a wire into the feedthrough **416**, of the wire terminal block **412**. The threaded plumbing connector **400** and the wire terminal block **412** in combination with a conductive material, in this example a wire (not shown), acts as a shunt for current traveling, along a pipe. It is preferable that the material of the wire terminal block **412** be the same material as the protruded section **410** however, this is not required as long as the material is low resistance and has a high conductivity. In addition, in the preferred embodiment, the first threaded end **304**, the second threaded end **306**, the outer surface of the hollow cylinder **402**, and the wire terminal block **412**, would be made of one solid piece of material. While in other embodiments the first threaded end **304**, the second threaded end **306**, the outer surface of the hollow cylinder **402**, and the wire terminal block **412** could be formed together from different materials through welding, glue, or other fastening methods.

Furthermore, the thread pattern **407** could be internal (female) or external (male) of the hollow cylinder **402**. In an external (male) embodiment, the valley of the threads would be along the hollow cylinder **402**, and the point of the threads at the thread pattern **407**. For an internal (female) thread pattern embodiment, the valley of the threads would be at the thread pattern **407**, and the point of the threads at the start of the hollow cylinder **402**. The wall thickness from the internal surface of the hollow cylinder **402**, to the start of the thread pattern will be approximately one hundredth (0.01) of an inch at a minimum similar to the thickness of CSST.

FIGS. **5A** and **5B** show inset views of the wire terminal block of the threaded plumbing connector **500A** and **500B**. In FIG. **5A**, the wire terminal block **512**, and set screw **514**, are shown in a ready positioning, prior to the fastening of a conductive material, such as a wire. As shown, the set screw **514** has a taper and a set screw thread pattern **518**, in addition it can be the same material as the wire terminal block **512** and in some cases a non-conductive material would be preferable. However, the set screw **514** does not have to be limited to the same material as the wire terminal block **512**. The shape and diameter of the feedthrough **516** can be set for a variety of standard conductive wire sizes.

FIG. **5B**, provides a view of the wire terminal block **512**, and the set screw **514**, with a conductive wire **520** connected to the wire terminal block **512**. The conductive wire **520**, by National Fire Protection Association standards, must be 6 AWG or larger in order to handle the levels of current to help mitigate against lightning damage. This means that the feedthrough **516** must have a minimum diameter of seven-tenths (0.17) of an inch. The diameter would have to go up with the larger sizes of wire available as well. For example, 0 AWG is thirty-two hundredths (0.32) of an inch in diameter. In the preferred embodiment, the smaller feedthrough would start at one three sixteenths of an inch ($\frac{3}{16}$), in order to accommodate a 6 AWG wire.

FIGS. **6A** and **6B** illustrate an alternative embodiment of the threaded plumbing connector **600A** and **600B** with a plurality of wire terminal blocks **612**. FIG. **6A** is a cross sectional view, and FIG. **6B** is a perspective view. The wire terminal blocks **612**, fill the space from the first thread pattern **608**, and protruded section **610**. Internal of the first thread pattern **608**, is the hollow cylinder **602**. The wire terminal blocks **612**, allow a feedthrough **616**, to run through

the width or depth of the protruded section **610**. A set screw **614** is used to secure a conductive wire (not shown) to the wire terminal blocks **612**, through threaded bores **615**. There can be a plurality of threaded bores **615**, depending on the size of the pipe and the threaded plumbing connector **600B**.

In this alternative embodiment, the wire terminal blocks **612** are internal of the protruded section **610** outer surface. By providing multiple wire terminal blocks **612**, and enlarging the protruded section **610**, the threaded plumbing connector **600A**, **600B** can serve as an electrical ground junction point and accommodate larger pipe sizes. Allowing installers to utilize the threaded plumbing connector **600A**, **600B** on additional types of pipe, for example black iron pipe that can run in size from an eighth ($\frac{1}{8}$) of an inch, all the way to twelve (12) inches.

This alternative embodiment also allows access to the wire terminal blocks **612** from any position of the threaded plumbing connector **600A**, **600B**. With multiple wire terminal blocks **612**, this apparatus is reachable in many confined spaces without reducing its effectiveness. This alternative embodiment, also allows for the threaded plumbing connector **600A**, **600B**, to serve as a wire junction point to attach a first conductive wire, and a second conductive wire. The threaded plumbing connector **600A**, **600B** can be constructed of a single low resistance and high conductivity material or multiple low resistance and high conductivity materials.

FIG. **7** illustrates the threaded plumbing connector **700** with a plurality of wire terminal blocks **712** in operation. With the plurality of wire terminal blocks **712**, the threaded plumbing connector **700** can also have multiple threaded bores **715** along outer face **711** of the protruded section **710**. These threaded bores **715**, allow the set screw **714** to connect the threaded plumbing connector **700**, to the conductive wire **720** via the wire feedthrough **716** and the wire terminal blocks **712**.

The threaded plumbing connector **700** can also act as a junction point for multiple conductive wires, for example, a first conductive wire **720** and a second conductive wire **721**. For example, a gas line feeds a hot water heater, and a space heater, the ground wires for both of those individual gas lines could return to the threaded plumbing connector **700**. Attaching to the plurality of wire terminal blocks **712**, and then be attached to the main ground via a single wire, thereby reducing the number of wire run throughout a building, a very important issue in large-scale construction projects.

FIGS. **8A** and **8B** illustrate the plumbing connector **800** in an unconnected state (FIG. **8A**) and a connected state (FIG. **8B**). Fluid, gas or other forms of liquid and gaseous mixtures can pass through the hollow cylinder **802**. The hollow cylinder **802** has an outer surface comprised of a first end **804** and a second end **806**, with a protruded section **810** interposed along the outer surface of the hollow cylinder **802** between the first end **804** and the second end **806**. The first end **804**, and second end **806** are illustrated as a male end, but are not limited to this illustration as the threaded ends **804/806** can also be female ends as well. The thread patterns, a first thread pattern **808** and a second thread pattern **809**, can be, but are not limited to, coarse or fine threads to allow the threaded plumbing connector to attach to a plurality of plumbing fixtures and components. The protruded section **810** in the exemplary embodiment of the present invention illustrated has a feedthrough **816**, wherein the feedthrough **816** is a bore running parallel to the fluid path through the hollow cylinder **802**. The feedthrough **816** is also connected to a threaded bore **815** to allow a setscrew

814 to compress or attach a wire **820**. The threaded bore **815** can be at a right angle to the feedthrough **816** or alternatively, as shown, be offset at an angle less than or greater than ninety degrees. It can be understood that there can be additional feedthroughs **816**, threaded bores **815**, and set-screws **814** along multiple surfaces of the protruded section **810**. It is further noted that the fitting depicted in **800** is generically known as a male union adapter. Male union adapters are typically sold and used with Gas Appliance Connectors, GACS. The adapter **800** is used to adapt a flare fitting to Iron Pipe Thread, IPT. In that, GACs are very prone to damage caused by current damaging the flared ends, a pair of the male union adapters **800** can be utilized, one on each end of the GAC. A shunt wire of high conductivity can be inserted in the feedthrough **816** on each of the male union adapters **800**. Should electrical fault current be travelling along a path from a gas appliance through the GAC and then black piping, the high conductivity shunt wire will keep a majority of the current off of the flared GAC fitting, thus deterring electrical damage.

The description of the present invention has been presented for purposes of illustration and description, and is not intended to be exhaustive or limited to the invention in the form disclosed. Many modifications and variations will be apparent to those of ordinary skill in the art. The embodiment was chosen and described in order to best explain the principles of the invention, the practical application, and to enable others of ordinary skill in the art to understand the invention for various embodiments with various modifications as are suited to the particular use contemplated. It will be understood by one of ordinary skill in the art that numerous variations will be possible to the disclosed embodiments without going outside the scope of the invention as disclosed in the claims.

I claim:

1. A pipe connector, which comprises:
 - a first end of a hollow cylinder, the first end of a hollow cylinder having a flared fitting;
 - a second end of the hollow cylinder, distal from the first end, the second end of a hollow cylinder having a flared or black iron pipe fitting;
 - a protruded section along an outer surface of the hollow cylinder, between the first end and the second end;
 - a wire connection terminal, affixed to one or more of an outer surface of the protruded section;
 - wherein the protruded section extends radially outward from the outer surface of the hollow cylinder along the entire circumference of the hollow cylinder; and
 - wherein the first end is for fastening the hollow cylinder to a first pipe fitting, and the second end is for fastening the hollow cylinder to a second pipe fitting.
2. The pipe connector of claim 1, wherein a cross section of the protruded section is a hexagon.
3. The pipe connector of claim 1, wherein a cross section of the protruded section is a polygon.
4. The pipe connector of claim 1, wherein the first end is a first male thread pattern, and the second end is a second male thread pattern.
5. The pipe connector of claim 1, wherein the first end is a first female thread pattern, and the second end is a second female thread pattern.
6. The pipe connector of claim 1, wherein the first end is a male thread pattern, and the second end is a female thread pattern.
7. The pipe connector of claim 1, wherein the first end is a female thread pattern, and the second end is a male thread pattern.

8. The pipe connector of claim 1, wherein the wire connection terminal further comprises:

- a block of electrically conductive material;
- a hollow feedthrough through the block of electrically conductive material parallel in direction to the first end, and the second end;
- a threaded bore through the block of electrically conductive material perpendicular to the hollow feedthrough; and
- a fastener fit to said threaded bore.

9. The pipe connector of claim 8, wherein the pipe connector and the wire connector terminal are made of one continuous material.

10. The pipe connector of claim 1, wherein the hollow cylinder is made of brass.

11. The pipe connector of claim 1, wherein the hollow cylinder is made of steel.

12. The pipe connector of claim 1, wherein the hollow cylinder is made of an electrically conductive material.

13. A pipe connector, which comprises:

- a first end of a hollow cylinder, the first end of a hollow cylinder having a flared fitting;
- a second end of the hollow cylinder, distal from the first end, the second end of a hollow cylinder having a flared or black iron pipe fitting;
- an outer surface cylinder, wherein the outer surface cylinder has a protrusion;
- wherein the protrusion extends radially outward from the outer surface of the hollow cylinder along the entire circumference of the hollow cylinder; and
- a plurality of wire connection terminals within the protrusion.

14. The pipe connector of claim 13, wherein each of the plurality of wire connection terminals comprises:

- a hollow feedthrough parallel to the first threaded end, or the second threaded end;
- a threaded bore perpendicular to the hollow feedthrough; and
- a fastener fit to said threaded bore.

15. The pipe connector of claim 13, wherein a cross section of the protrusion is a hexagon.

16. The pipe connector of claim 13, wherein a cross section of the protrusion is a polygon.

17. The pipe connector of claim 13, wherein the first end is a first male thread pattern, and the second end is a second male thread pattern.

18. The pipe connector of claim 13, wherein the first end is a first female thread pattern, and the second end is a second female thread pattern.

19. The pipe connector of claim 13, wherein the first end is a male thread pattern, and the second end is a female thread pattern.

20. The pipe connector of claim 13, wherein the first end is a female thread pattern, and the second end is a male thread pattern.

21. A method of reducing current along a pipe comprising:

- (1) attaching a first pipe, the first pipe having a flared fitting, to a plumbing connector, the plumbing connector having a flared fitting corresponding to the flared fitting of the first pipe;
- (2) attaching a second pipe, the second pipe having a flared or black iron pipe fitting, to the plumbing connector, the plumbing connector having a flared or black iron pipe fitting corresponding to the flared or black iron pipe fitting of the second pipe;
- (3) connecting a wire to hollow feedthrough bored through the side of a protruded section of the hollow

cylinder, wherein the protruded section extends radially outward from the outer surface of the hollow; and
 (4) shunting current away from said first pipe and said second pipe.

22. The method of reducing the current along the first pipe of claim 21, wherein the attaching step (1) further comprises attaching a female thread pattern of the first pipe to a first male thread pattern of the plumbing connector.

23. The method of reducing the current along the first pipe of claim 21, wherein the attaching step (1) further comprises attaching a male thread pattern of the first pipe to a first female thread pattern of the plumbing connector.

24. The method of reducing the current along the second pipe of claim 21, wherein the attaching step (2) further comprises attaching a female thread pattern of the second pipe to a second male thread pattern of the plumbing connector.

25. The method of reducing the current along the second pipe of claim 21, wherein the attaching step (2) further comprises attaching a male thread pattern of the second pipe to a second female thread pattern of the plumbing connector.

26. The method of reducing the current along the first and the second pipe of claim 21, wherein the shunting step (4) further comprises shunting the current away from said first and said second pipe, through the wire terminal block, and a wire attached to ground.

27. The method of reducing the current along the first and the second pipe of claim 21, wherein the connecting step (3) further comprises:

inserting the wire into the wire terminal block; and securing the wire to the wire terminal block.

28. A pipe connector, which comprises:
 a first end of a hollow cylinder, the first end of a hollow cylinder having a flared fitting;
 a second end of the hollow cylinder, distal from the first end, the second end of a hollow cylinder having a black iron pipe fitting;

a protruded section along an outer surface of the hollow cylinder, between the first threaded end and the second threaded end;

a hollow feedthrough, the hollow feedthrough bored through one or more of the outer surface of the protruded section;

wherein the protruded section extends radially outward from the outer surface of the hollow cylinder along the entire circumference of the hollow cylinder; and wherein the first end is for fastening the hollow cylinder to a first connection, and the second end is for fastening the hollow cylinder to a second connection.

29. The pipe connector of claim 28, wherein the protruded section further comprises a threaded bore connecting to the hollow feedthrough to the outer surface of the protruded section.

30. The pipe connector of claim 29, wherein the threaded bore is filled with a setscrew to pressure a wire within the feedthrough.

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