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(54) **GATE SAFETY BARRIER ASSEMBLY**

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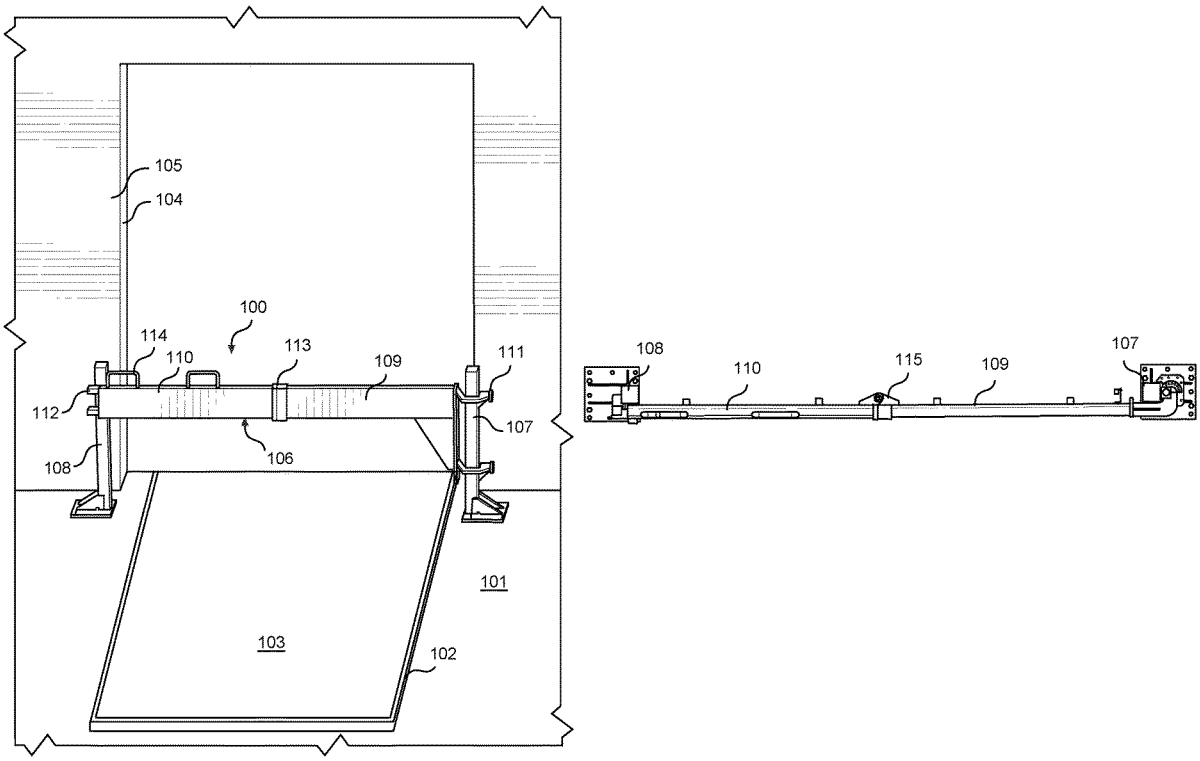
(52) **U.S. Cl.**
CPC ***E01F 13/024*** (2013.01); ***E01F 13/06*** (2013.01)

(57) **ABSTRACT**

A gate safety barrier system is provided for use at a loading dock to prevent accidental or inadvertent movement of a loading dock vehicle and/or personnel through an access passageway provided on the loading dock. The gate safety barrier includes a pair of bollards positioned on opposite sides of the passageway and a horizontal center member pivotally mounted on pivot bollard. The horizontal center member includes two sections connected together by means of a center hinge. The horizontal center member moves to close and block the passageway. When in the closed position the horizontal center member spans the distance between the bollards. The system provides safety, ease of use, and improved functionality which protect personnel while the assembly is being moved between closed blocked passageway to open unblocked passageway.



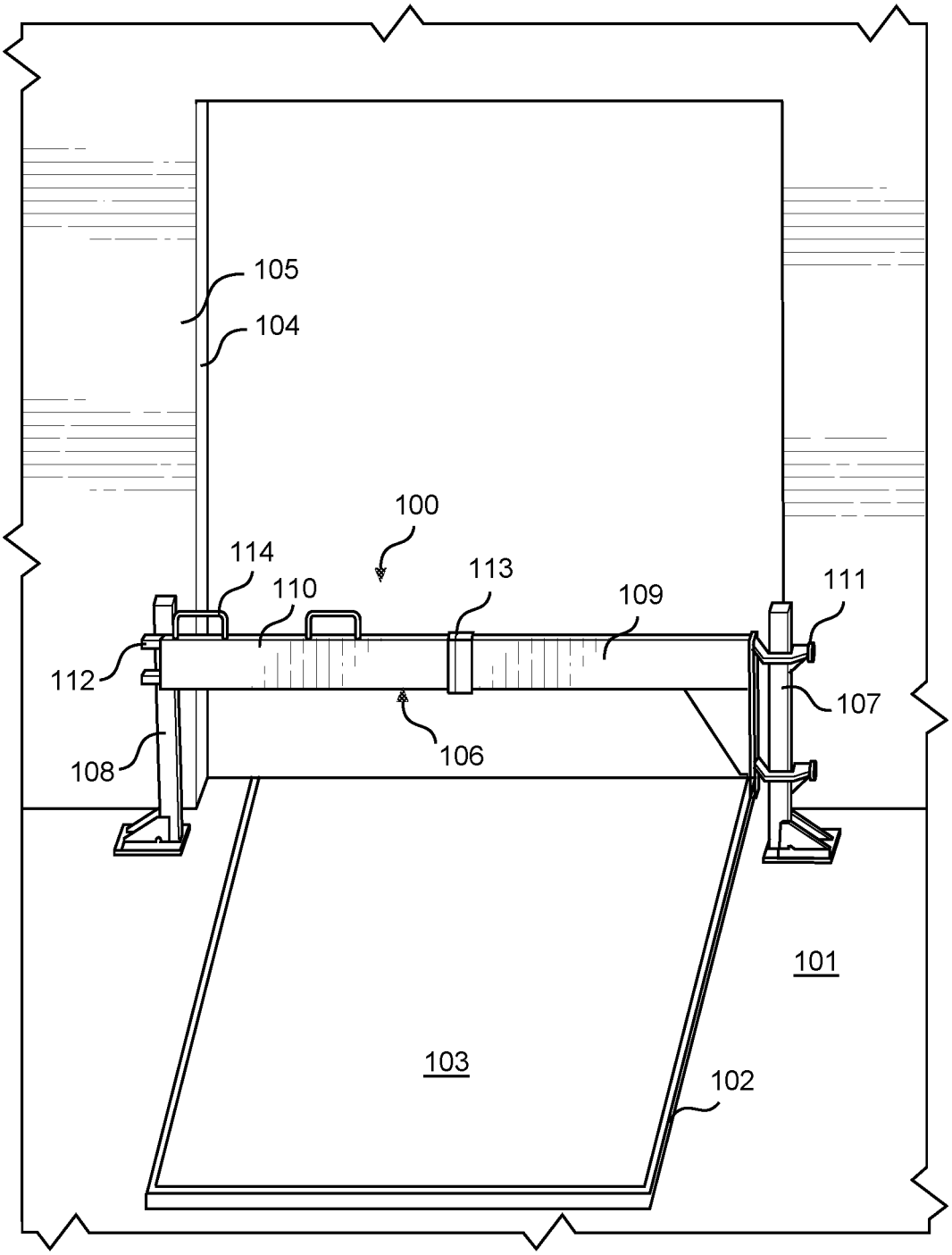


FIG. 1A

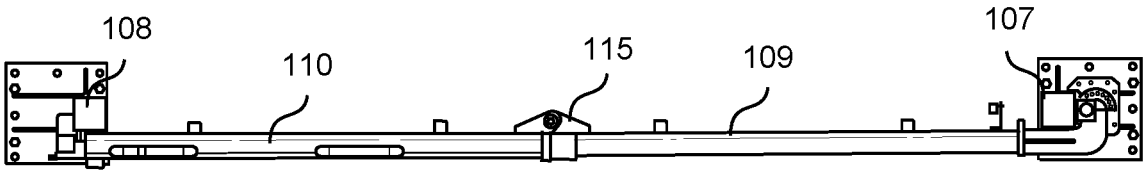


FIG. 1B

FIG. 1C

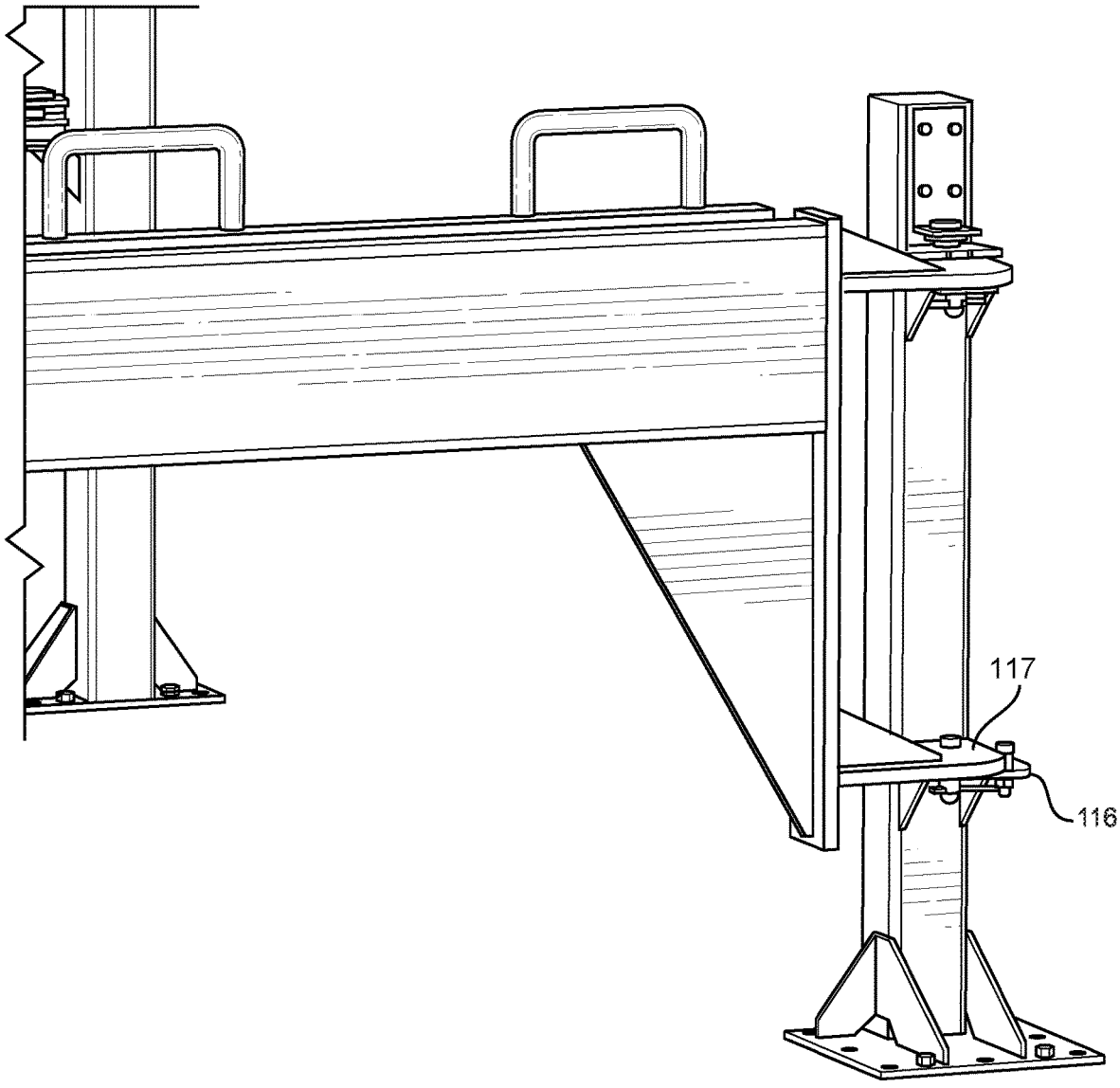


FIG. 1D

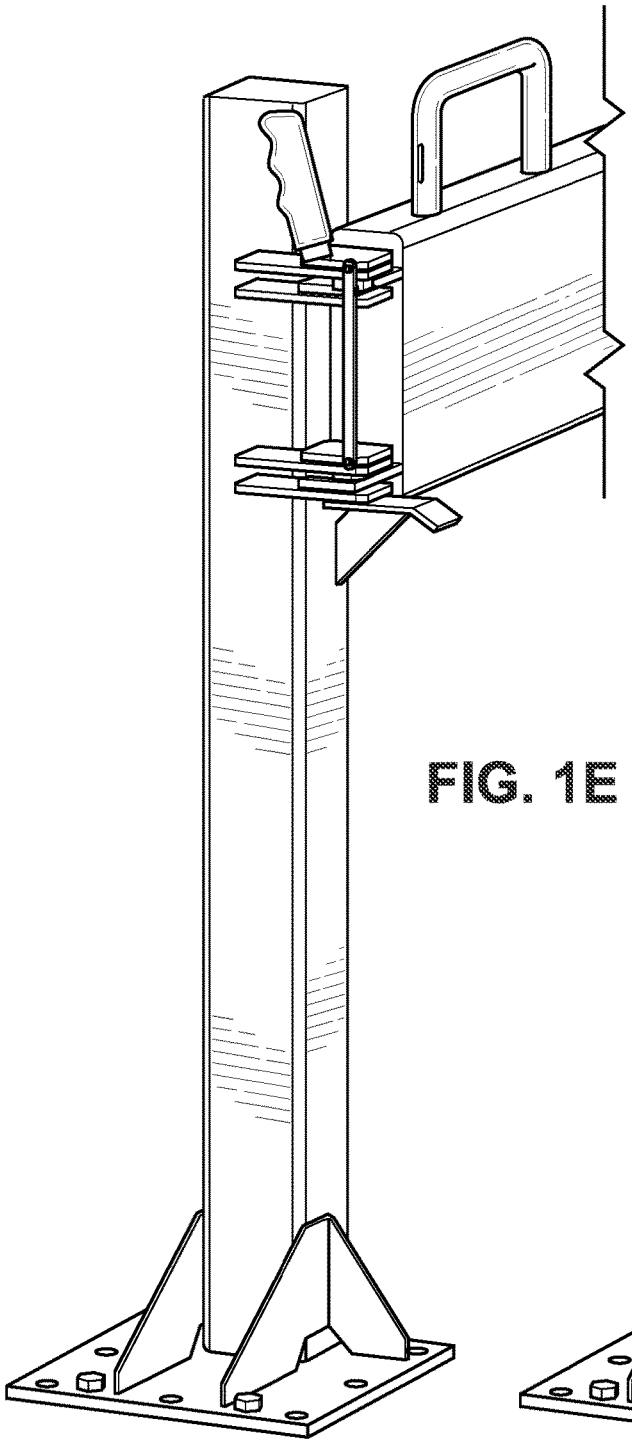


FIG. 1E

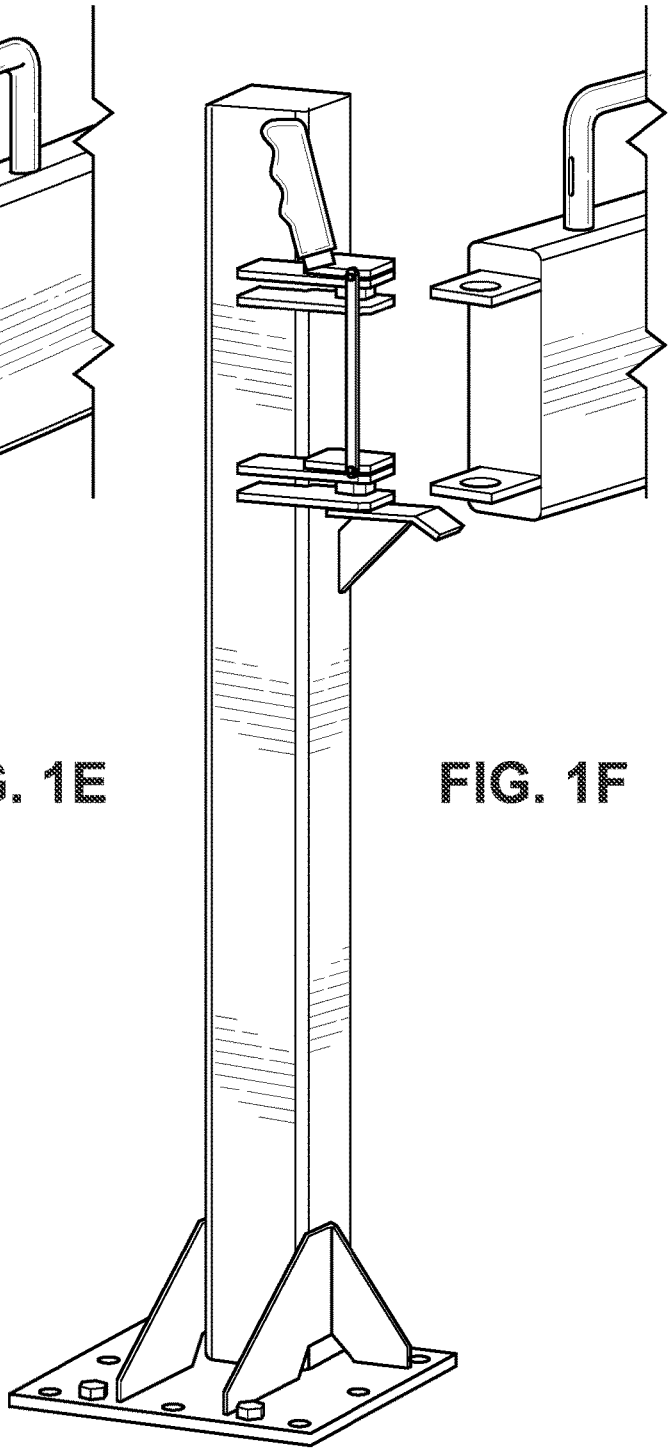


FIG. 1F

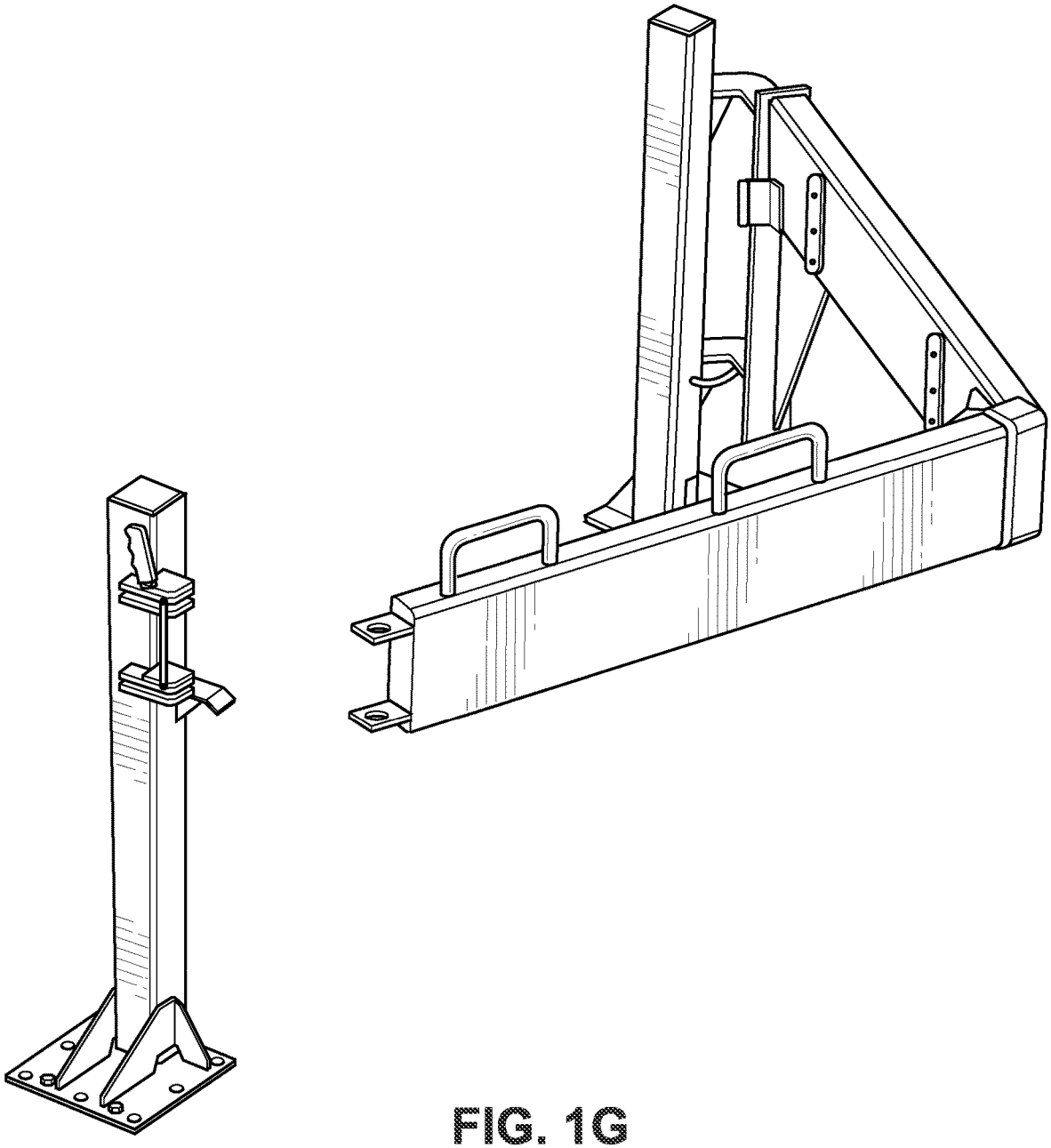


FIG. 1G

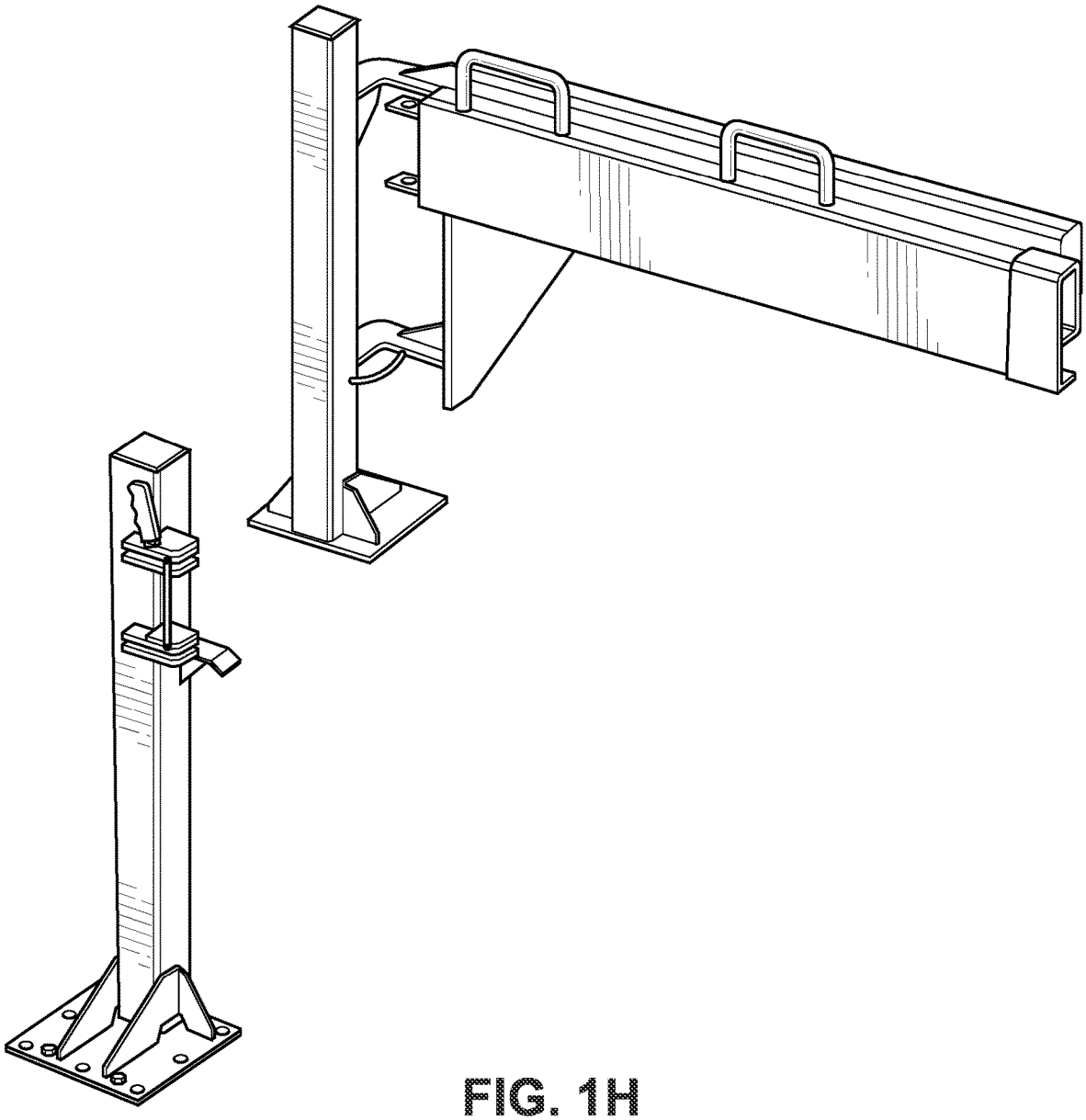


FIG. 1H

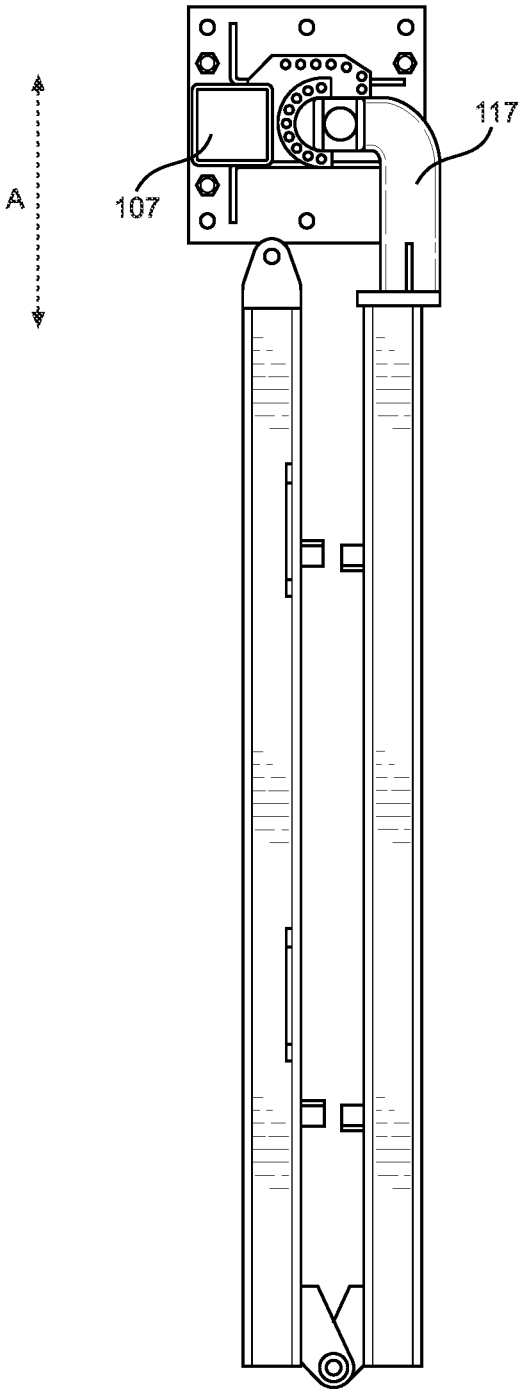


FIG. 2A

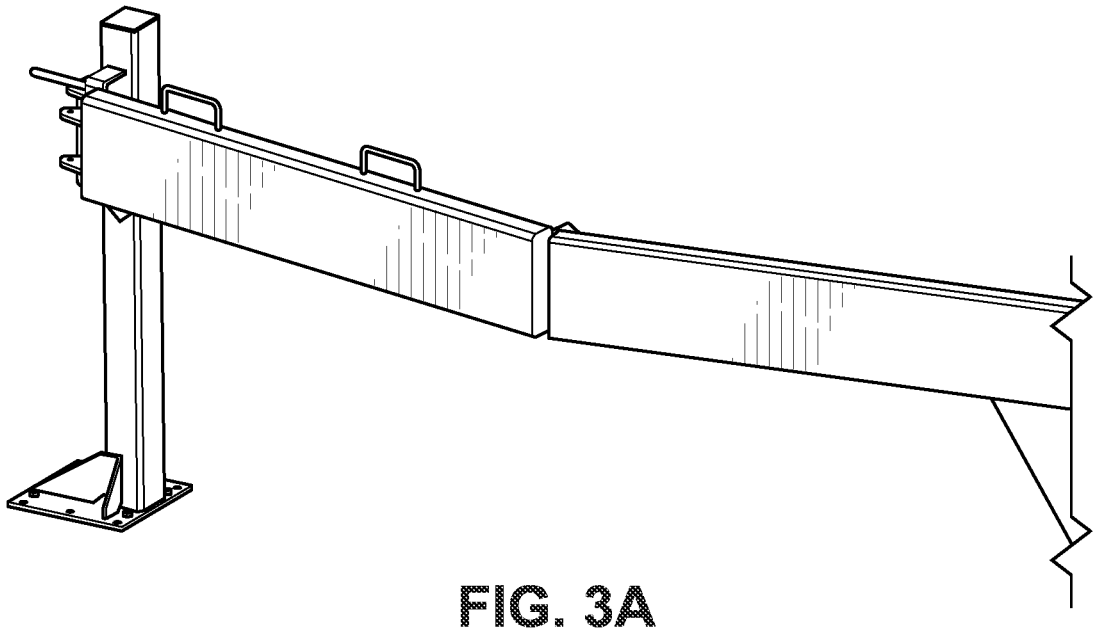


FIG. 3A

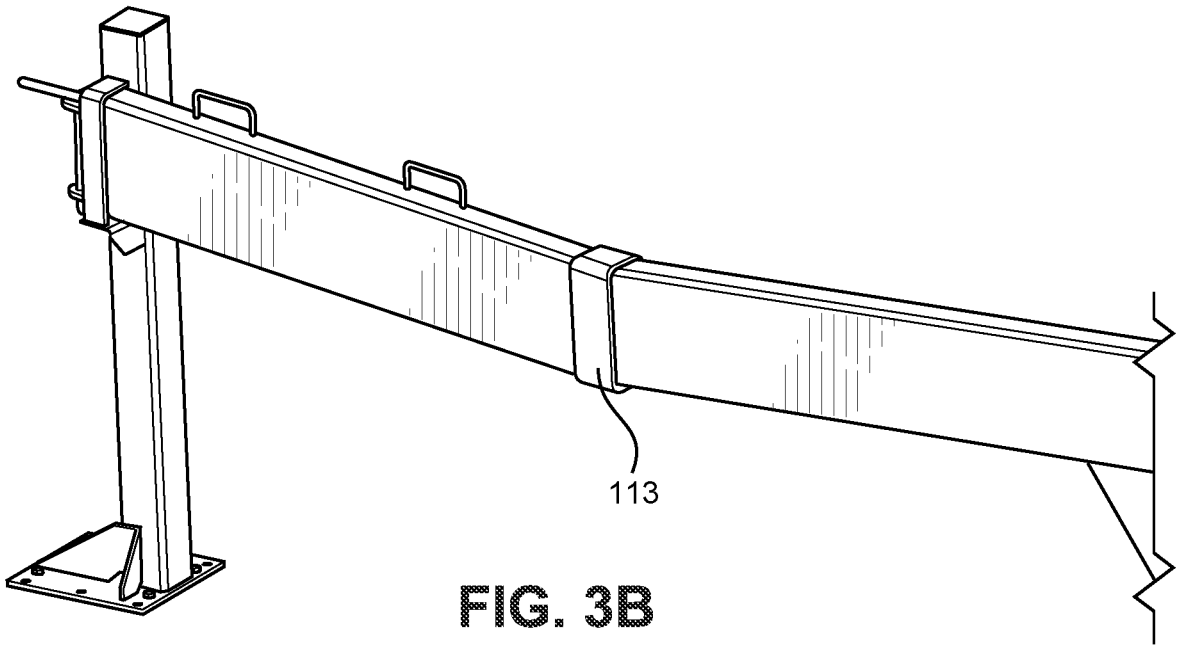


FIG. 3B

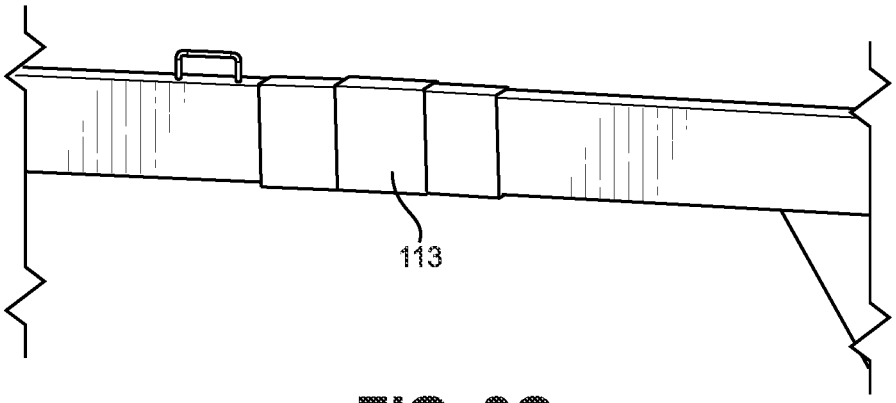


FIG. 3C

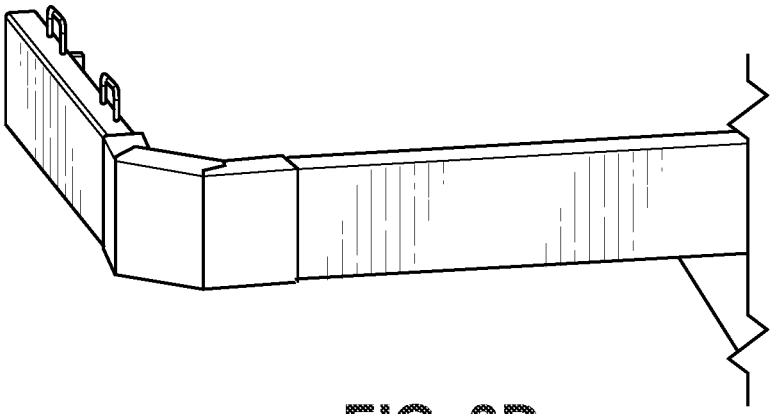


FIG. 3D

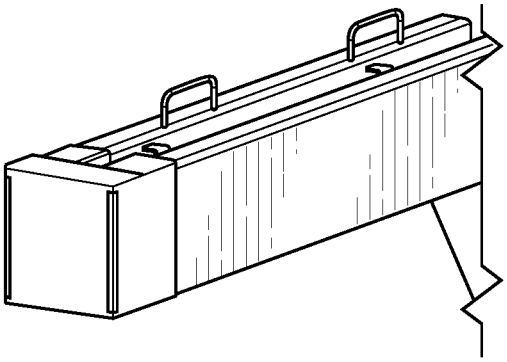


FIG. 3E

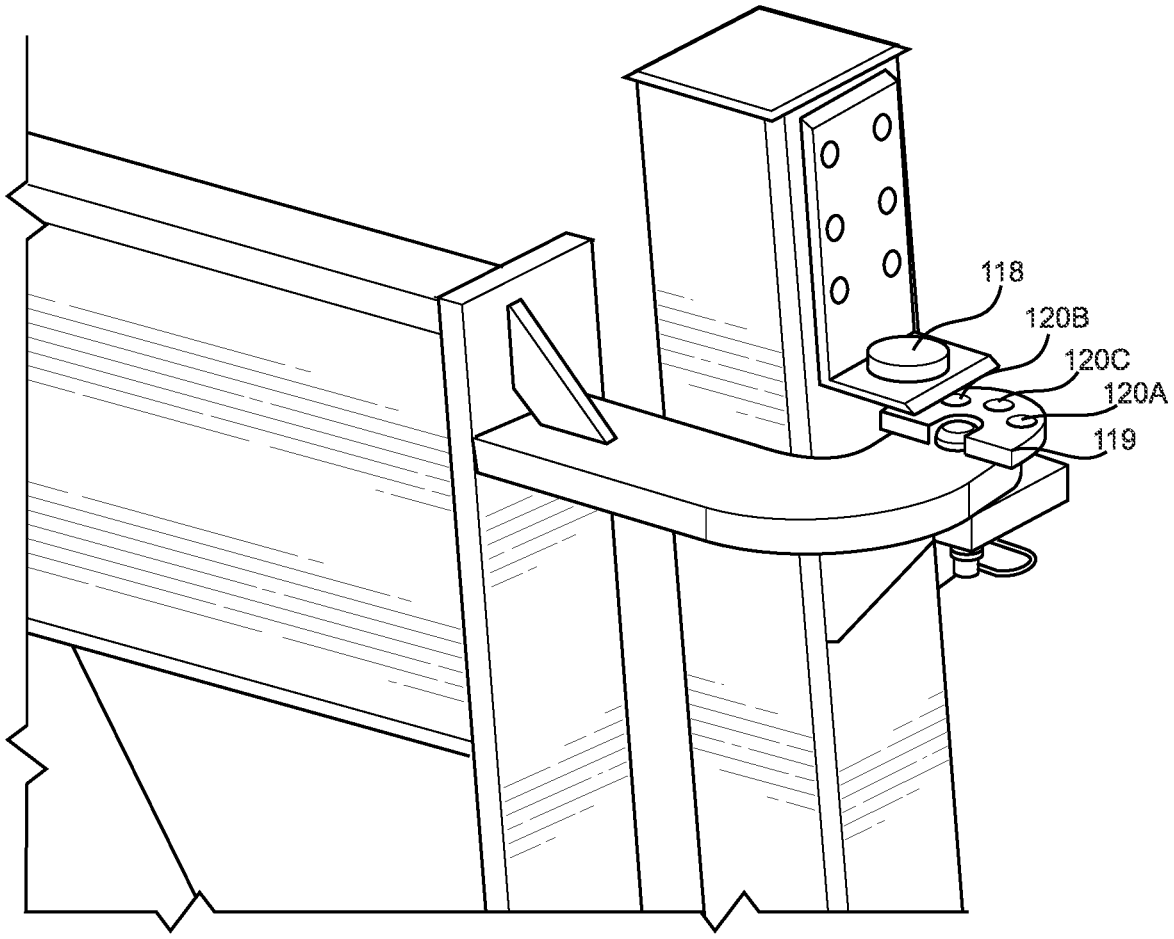


FIG. 4A

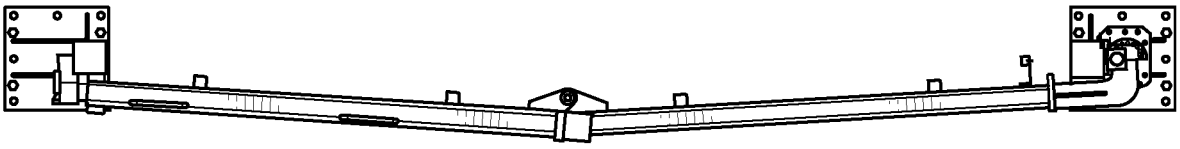


FIG. 4B

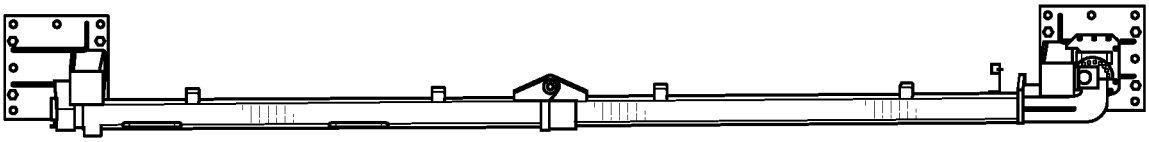


FIG. 4C

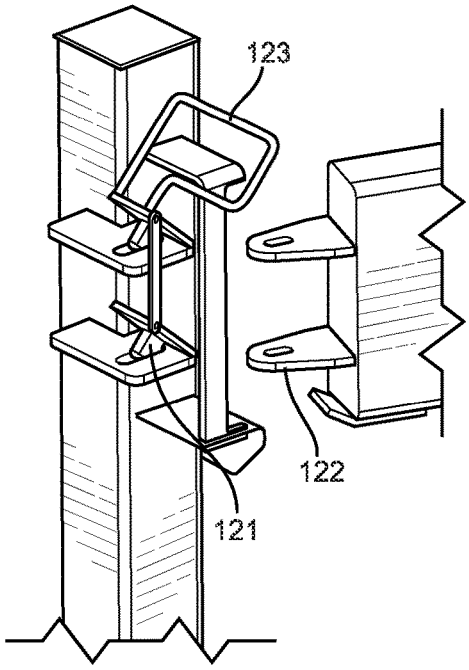


FIG. 5A

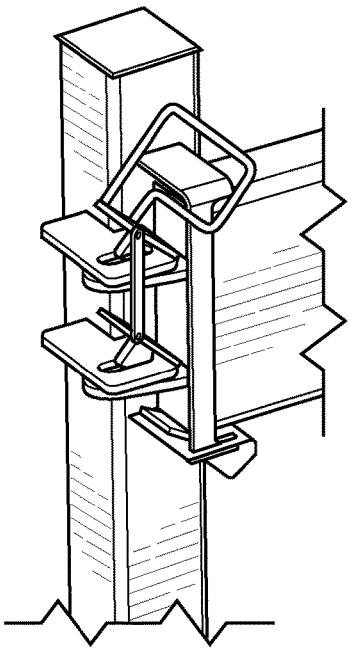


FIG. 5B

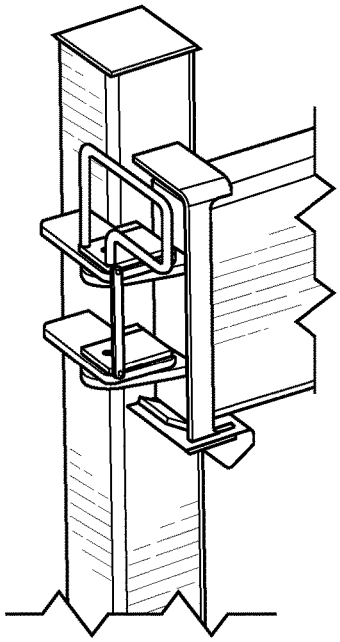


FIG. 5C

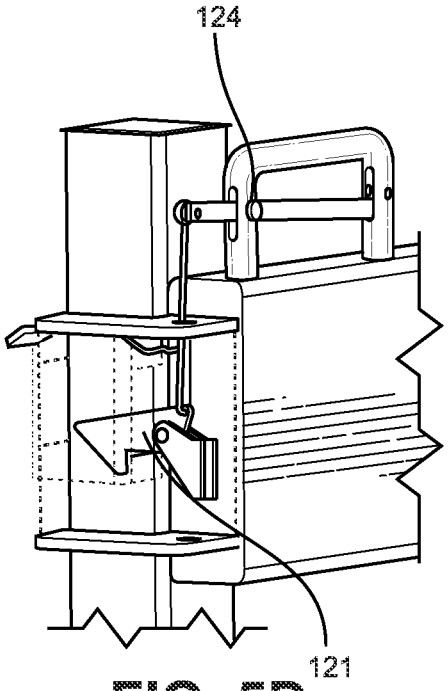


FIG. 5D

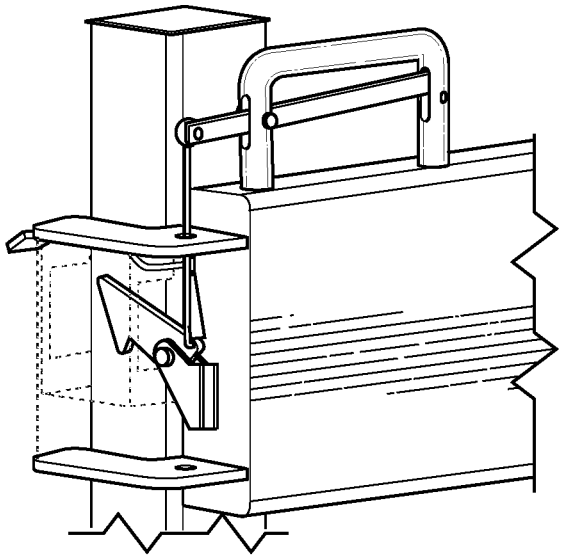


FIG. 5E

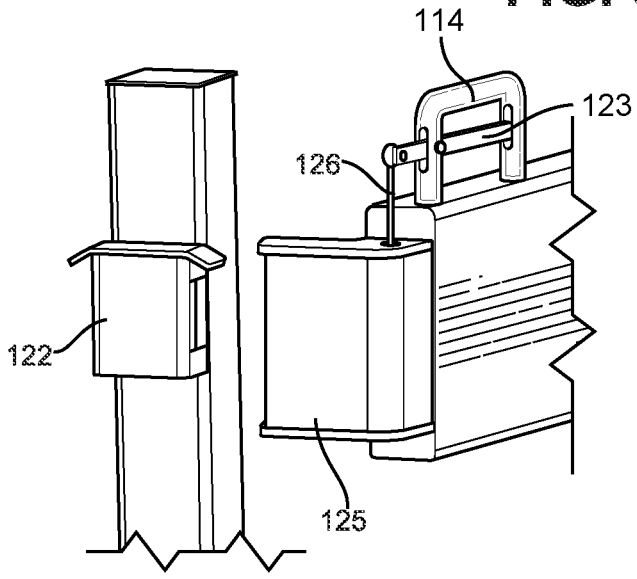


FIG. 5F

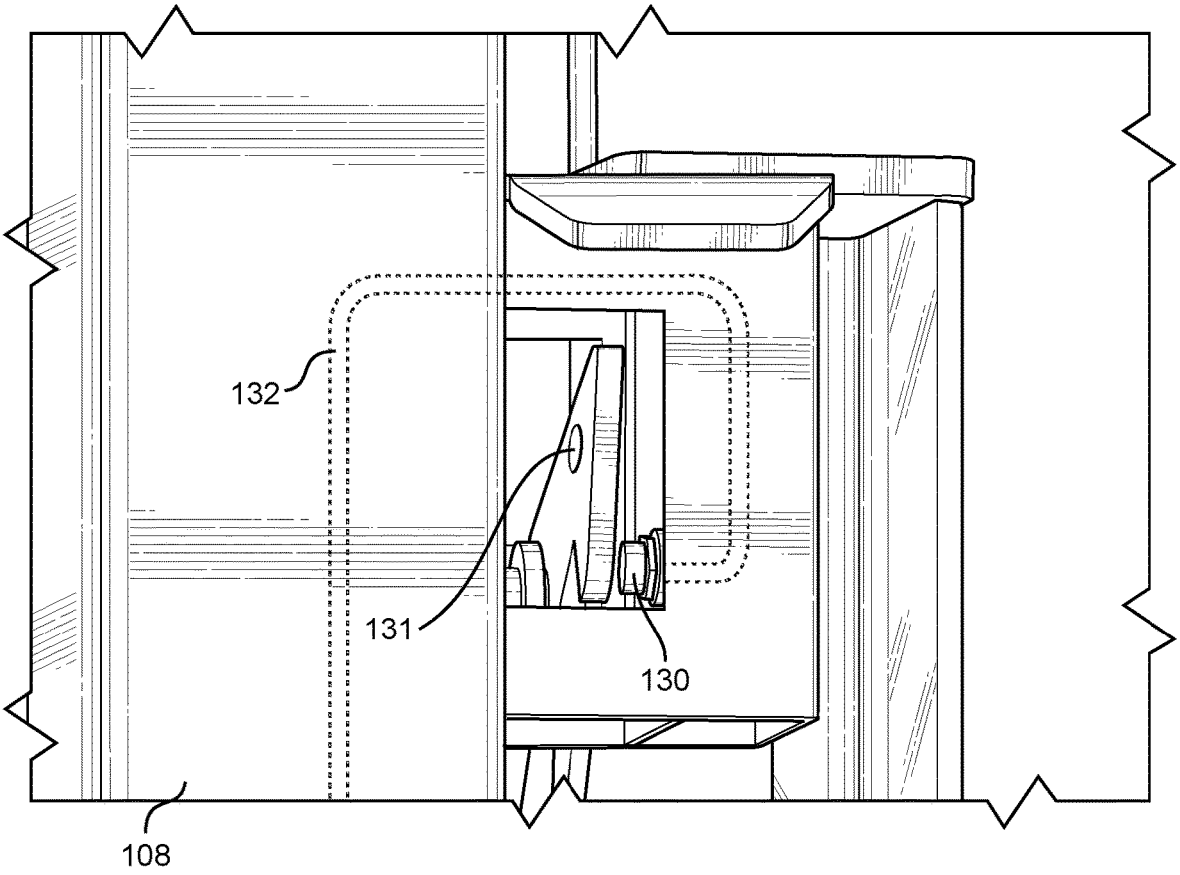


FIG. 6A

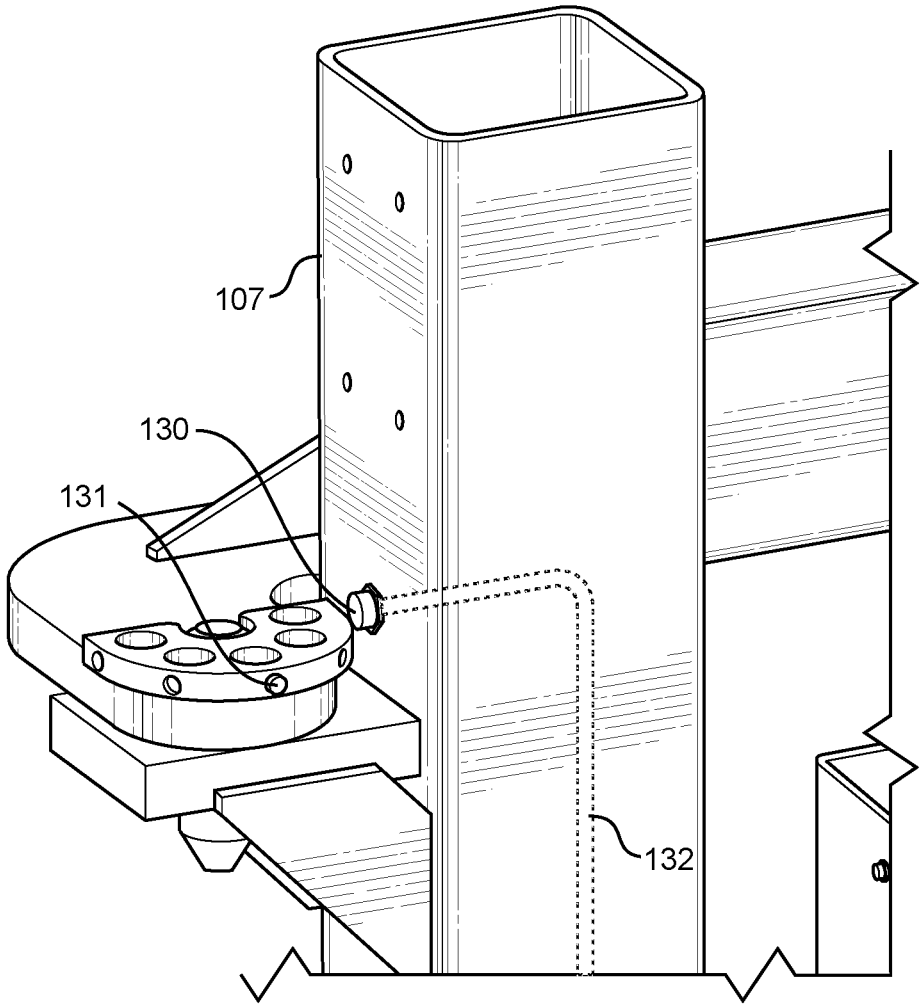


FIG. 6B

GATE SAFETY BARRIER ASSEMBLY

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of prior-filed, co-pending U.S. Provisional Patent Application No. 63/076,224, filed on Sep. 9, 2020, the contents of which are incorporated herein by reference in their entirety.

BACKGROUND OF THE INVENTION

[0002] The present disclosure is directed to a loading dock system, and more specifically to a system for providing increased safety and efficiency in a loading dock gate safety barrier.

[0003] One of the primary concerns for manufacturing and warehousing personnel is personnel and material safety and protection when using motorized goods-handling devices, such as forklifts, hoists, lift trucks, and other motorized handlers. Because sight lines of lift drivers may be limited, errors can cause material damage and injuries, some severe, to personnel. Facilities may have areas of changing elevation or high traffic as well as loading areas uneven with delivery vehicles. A driver who cannot see the changing elevation, traffic, or absence of delivery vehicles may accidentally direct their goods-handling devices into a dangerous area, resulting in injury or damage. Workers may also fail to perceive dangerous areas, resulting in injury if they enter unaware.

[0004] One solution is to install security doors in front of dangerous areas. However, these doors may need to be opened for ventilation or visibility, allowing uncontrolled access to the area. Visual and audible alert devices require power sources and may not be effective for all environments. Many devices are also incapable of stopping a goods-handling device, which may only add to potential damage and injury.

[0005] There is an unmet need in the art for a safety system which does not block visibility or ventilation and is capable of withstanding impact from motorized goods-handling devices.

BRIEF SUMMARY

[0006] The present invention is a gate safety barrier system. The system includes a pivot bollard positioned on a side of a passageway opposite a latch bollard. A center member assembly is pivotally mounted to the pivot bollard such that the center member assembly is selectively movable between a closed configuration blocking the passageway and an open configuration unblocking the passageway. The center member assembly is pivotally mounted to the pivot bollard by at least one hinge pin extending through at least one hinge support bracket and at least one pin connection such that rotation of the center member assembly relative to the pivot bollard is in a horizontal plane. The hinge support bracket is connected to the pivot bollard at a 180-degree angle to a longitudinal axis of the passageway and the pin connection is connected to the center member assembly. The center member assembly includes a left member pivotally connected to a right member with a center hinge such that rotation of the left member relative to the right member is in a horizontal plane.

BRIEF DESCRIPTION OF THE DRAWING(S)

[0007] FIG. **1***a* is a front perspective view of a gate safety barrier system shown in closed configuration.

[0008] FIG. **1***b* is a top view of the gate safety barrier system in the closed configuration.

[0009] FIG. **1***c* is a top view of the gate safety barrier system in the open configuration.

[0010] FIG. **1***d* is a fragmentary perspective view of the pivot bollard.

[0011] FIG. **1***e* is a fragmentary perspective view of a latch bollard with the gate safety barrier system in latched position.

[0012] FIG. **1***f* is a fragmentary perspective view of the latch bollard with the gate safety barrier system in unlatched position.

[0013] FIG. **1***g* is a perspective view of the gate safety barrier system in a partially open position.

[0014] FIG. **1***h* is a perspective view of the gate safety barrier system in the open configuration.

[0015] FIG. **2***a* is a top view of the gate safety barrier assembly in the open configuration.

[0016] FIGS. **3***a* and **3***b* are perspective views of the gate safety barrier system in a partially open position without and with a covering, respectively.

[0017] FIGS. **3***c*, **3***d*, and **3***e* are perspective views of the gate safety barrier system with a segmented covering in a closed, partially open, and open position, respectively.

[0018] FIG. **4***a* is a partial perspective view of the gate safety barrier system showing a detent and receiving plate.

[0019] FIGS. **4***b* and **4***c* are top views of the gate safety barrier system in the closed configuration.

[0020] FIGS. **5***a*, **5***b*, and **5***c* are partial perspective views of the gate safety barrier system with a latch feature in an unlatched, latching, and latched configuration, respectively.

[0021] FIGS. **5***d*, **5***e*, and **5***f* are partial perspective views of the gate safety barrier system with a latch feature in a latched, unlatching, and unlatched configuration, respectively.

[0022] FIGS. **6***a* and **6***b* are partial perspective views of the gate safety barrier system with a gate interlock on the side of the latch bollard and the pivot bollard, respectively.

[0023] It should be understood that for clarity, not every part is labeled in every drawing. Lack of labeling should not be interpreted as a lack of disclosure.

DETAILED DESCRIPTION OF THE INVENTION

[0024] In the present description, certain terms have been used for brevity, clearness and understanding. No unnecessary limitations are to be applied therefrom beyond the requirement of the prior art because such terms are used for descriptive purposes only and are intended to be broadly construed. The different systems and methods described herein may be used alone or in combination with other systems and methods. Various equivalents, alternatives and modifications are possible within the scope of the appended claims. Each limitation in the appended claims is intended to invoke interpretation under 35 U.S.C. § 112, sixth paragraph, only if the terms "means for" or "step for" are explicitly recited in the respective limitation.

[0025] FIGS. **1***a* through **1***h* provide multiple views of an exemplary embodiment of a gate safety barrier **100**. FIGS. **1***a* through **1***h* represent a gate safety barrier **100** comprised

of a latch bollard **108** and a pivot bollard **107** with a horizontal center member assembly **106** pivotally attached to the pivot bollard **107**. The center member **106** is comprised of left and right members **109** and **110** pivotally attached to each other with center hinge **115**.

[0026] One advantage of gate safety barrier **100** is that it can pivot in a horizontal plane, therefore no counterbalance is needed to make the gate easy to open. If the gate pivoted in a vertical plane such as an up and down motion, some sort of counterbalance such as a spring or counterweight would be needed to operate the gate to overcome the heavy construction of the gate. The gate safety barrier **100** is robust because it has to withstand high kinetic energy from a forklift truck. In this gate safety barrier **100**, by not needing a counterbalance, this reduces cost, simplifies design, and makes installation quick and easy. The structure of the gate safety barrier **100** is comprised of simple tubing and plates, easy to fabricate, weld, and assemble.

[0027] Since the gate safety barrier **100** pivots in a horizontal plane from the pivot bollard, it is hinged near its center at center hinge **115** to avoid taking up unnecessary space in front of a door opening **104**. By having two sections (left and right members **109** and **110**) instead of one long section pivoting on a bollard, horizontal center member assembly **106** essentially folds in half. The center hinge **115** attached to the left and right members **109** and **110** can be situated anywhere along the space between the ends. The center location is one potential arrangement. By having the center hinge **115** in the center location, the gate safety barrier **100** takes up the least amount of space when in the folded open position.

[0028] A dock floor **101** has a recessed pit **102**. A dock leveler **103** is conventionally installed in the pit **102**. The dock leveler **103** is shown in the stored cross-traffic position. It will be understood that at the door opening **104** which is cut into a wall **105**, a dock leveler lip hangs pedant from the dock leveler **103**.

[0029] In accordance with a first embodiment of this invention, the gate safety barrier **100** comprises pivot bollard **107** and latch bollard **108**. The two bollards are upright, laterally spaced stationary support bollards positioned on opposite sides of passageway. They are anchored by suitable means (not shown) into the concrete floor **101**. The gate safety barrier **100** further comprises the horizontal center member assembly **106** having two sections, left and right members **109** and **110**, hinged together with center hinge **15** as shown is FIG. **1***e*. In one embodiment, center member assembly **106** also contains one covering **113** over center hinge **115**. One end of the horizontal center member **109** is pivotally connected to pivot bollard **107** with hinge pins **111**. The bollard on opposite side of passageway is latch bollard **108**.

[0030] In the embodiment seen in FIGS. **1***d* and **2***a*, the hinge support brackets **116** on the pivot bollard **107** are moved 180 degrees away from the passageway about the pivot bollard **107** to the opposite side of the pivot bollard **107** facing the opening. The hinge support brackets **116** are at the opposite side of the pivot bollard **107** from the longitudinal axis A of the passageway. To orientate to the new support pivot location, the shape of the pin connection **117** on the end of the horizontal center member assembly **106** essentially wraps around the pivot bollard **107** in the open passageway configuration; as a result, the inner surface of the pin connection **117** conforms to the outer surface of the pivot bollard **107**. This allows access to the full width of the passageway between the bollards **107** and **108** without the horizontal center member assembly **106** blocking any part of the passageway between bollards. In the embodiment shown, the pivot bollard **107** has a square cross-section so the pin connections **117** are changed to an L-shaped connection to mate up to the location of the hinge support brackets **116** on the pivot bollard **107**.

[0031] As seen in FIG. **3***a*, when the horizontal center member assembly **106** starts to move from the closed blocked passage to the open unblocked passageway, the area around center hinge **115** expands to uncover said area. At this point of opening, the distance between left and right members **109** and **110** is too large to cause a pinch point. Conversely, as the horizontal center member assembly **106** is moved from an open unblocked passageway to a closed blocked passageway, the opening at the area around center hinge **115** contracts and creates a pinch point when left and right members **109** and **110** are in close proximity to one another. In various embodiments shown in FIGS. **3***b* through **3***e*, a covering **113** over the center section of horizontal center member assembly **106** at or in close proximity to center hinge **115** allows avoidance of a potential pinch point.

[0032] In the embodiment shown in FIG. **3***b*, covering **113** is a flexible type of material. Said material can be attached to or in close proximity to center hinge **115** by means of a connection that allows covering **113** to always cover the area around center hinge **115** on when horizontal center member assembly **106** moves from closed blocked passageway to open unblocked passageway and all positions in between. Other embodiments with a flexible covering **113** also include a means of attaching material to an additional area besides the area around center hinge **115** such as but not limited to left and/or right members **109** and **110** to keep the area around center hinge **115** covered from closed blocked passageway to open unblocked passageway and all positions in between.

[0033] In the embodiment shown in FIGS. **3***c* through **3***e*, the covering **113** is a metal cover consisting of multiple sections to cover the area around center hinge **115**. Metal covering **113** consists of multiple sections to adjust and move with horizontal center member assembly **106** to maintain coverage of the area around center hinge **115** from closed blocked passageway to open unblocked passageway and all positions in between. The multiple sections will overlap one another so as not to causes a pinch point among the rigid sections themselves. The multiple sections of the covering **113** are affixed to the area around center hinge **115** by means of a pivoting and/or sliding connection. This connection will allow the multiple sections of the covering **113** to cover the area around center hinge **115** from closed blocked passageway to open unblocked passageway and all positions in between.

[0034] In another embodiment, a semi-rigid material is used for covering **113**, wherein said material is rubber, brush, or plastic to cover the area around center hinge **115**, similarly to the flexible material shown in FIG. **3***b*. This material is attached to one side of the horizontal center member assembly **106**. As the horizontal center member assembly **106** is operated from an open unblocked passageway to a closed blocked passageway, the opening of the area around center hinge **115** contracts; the semi-rigid material of the covering **113** will then cover the opening to prevent a pinch point when the left and right members **109** and **110** are

in close proximity to one another. If an operator's hands are in the area around center hinge **115**, the semi rigid characteristics of the material will push away personnel's hands from said center hinge **115** without causing harm.

[0035] Another embodiment of gate safety barrier **100** shown in FIGS. **4***a* through **4***c* includes a detent **118** that automatically holds horizontal center member assembly **106** in desired position but yet will release if struck with fork-lift vehicle, causing no damage to the gate safety barrier **100**. In the embodiment shown in FIGS. **4***a*-**4***c*, the detent **118** is mounted on pivot bollard **107** and has a ball detent configuration, though detent **118** may have any detent configuration known in the art. A receiving plate **119** fixed to the pivot end of horizontal center member assembly **106** will contain at least one receiving feature **120**. The exemplary embodiment includes multiple receiving features **120***a*, **120***b*, and **120***c*. The receiving feature **120** comprises any feature capable of receiving the detent **118**, including, but not limited to, holes, notches, depressions, or slots. The configuration may also be reversed, with the detent **118** fixed to the pivot end of horizontal center member assembly **106** and the receiving plate **119** mounted on pivot bollard **107**.

[0036] When the receiving plate **119** fixed to the pivot end of the horizontal center member assembly **106** rotates, the detent **118** enters the receiving feature **120***a* in the receiving plate **119**, keeping the horizontal center member assembly **106** in a fixed position that maintains an unblocked passageway. To move the horizontal center member assembly **106** to another position or back to closed blocked passageway, the operator simply pushes/pulls the horizontal center member assembly **106** and the detent **118** will automatically dislodge from the receiving feature **120***a* in the receiving plate **119**.

[0037] Another feature of the detent **118** is to keep the left and right members **109** and **110** parallel (in line) to one another when the horizontal center member assembly **106** is latched and in the closed blocked passageway position, as seen in FIGS. **4***b* and **4***c*. Gate latches typically have some tolerance and "play" built in so installation and alignment of the components of the gate safety barrier **100** does not have to be precise. This may allow the left and right members **109** and **110** of the horizontal center member assembly **106** not to be parallel (in line) to one another, as seen in FIG. **4***b*. By having another receiving feature **120***b* in the receiving plate **119** that allows the detent **118** to enter when the horizontal center member assembly **106** is latched and the left and right members **109** and **110** are parallel to one another will hold the horizontal center member assembly **106** in this position until the horizontal center member assembly **106** is unlatched and moved by operator. Additional receiving features **120***c* in the receiving plate **119** may be radially spaced from receiving features **120***a* and/or **120***b* allow the horizontal center member assembly **106** to be held in one or more partially open positions.

[0038] In another embodiment, a latch feature **112** holds the horizontal center member assembly **106** to the latch bollard **108** until a movement from operator to detach the horizontal center member assembly **106** from the latch bollard **108**. Multiple embodiments of the latch feature **112** are possible.

[0039] In the first embodiment, the horizontal center member assembly **106** latches automatically when closed, without the need of the operator to perform a separate operation, and requires the operator to release it to open. This also ensures gate is always latched for improved safety. The operator guides the horizontal center member assembly **106** from the open unblocked passageway to the closed blocked passageway by means of the horizontal center member assembly **106** pivoting on pivot bollard which is on opposite side of passageway opening from the latch bollard. As shown in FIG. **5***a* through **5***c*, the operator guides the horizontal center member assembly **106** to the latch bollard **108**, the latch end of the horizontal center member assembly **106** will engage the latch feature **112** on latch bollard **108**. Upon fully extending the horizontal center member assembly **106** to the closed block passageway, at least one latch **121** will fully seat into at least one corresponding latch receiver **122** of the horizontal center member assembly **106**. This completes the automatic latching feature of the gate safety barrier **100** without an additional operation needed to be done by operator. To unlatch the horizontal center member assembly **106**, the operator must unlatch the latch **121** seated in the latch receiver **122** of the horizontal center member assembly **106** using a latch actuator **123** operably connected to the latch **121**. The latch actuator **123** may be a type of mechanism such as, but not limited to, a lever, handle, linkage, and/or a combination thereof. This will disengage the latch **121** from the latch receiver **122** which will enable operator to move the horizontal center member assembly **106** to the open configuration unblocking the passageway.

[0040] In certain embodiments, as shown in FIGS. **5***d* through **5***f*, a latch release assembly **124** may be connected to at least one handle **114** used to open the gate safety barrier **100**. The latch release assembly **124** may be comprised of at least one latch actuator **123** mounted or otherwise connected to the handle **114**, at least one latch **121** mounted on the latch end of the horizontal center member assembly **106**, at least one latch containment bracket **125** mounted on the latch end of horizontal center member assembly **106** over the latch **121**, and at least one latch receiver **122** mounted on latch bollard **108**.

[0041] In certain embodiments, the latch release assembly **124** also includes at least one actuator link **126** connecting the latch **121** and the latch actuator **123**. The actuator link **126** may be, but is not limited to, at least one cable, rigid linkage, or combination thereof. This actuator link **126** allows increased distance between the latch **121** and the latch actuator **123**.

[0042] With the latch release **124** near the handle **114** on the horizontal center member assembly **106**, an operator can easily unlatch and then move the horizontal center member assembly **106**. To unlatch the horizontal center member assembly **106**, the operator actuates latch release **124** to unlatch the latch **121** seated in at least one latch receiver **122** of the latch bollard **108**.

[0043] To operate the gate, the operator moves the latch actuator **123** which is in close proximity to the handle **114** on the horizontal center member assembly **106** to actuate the latch **121**, potentially through the use of the actuator link **126**. This action unlatches the horizontal center member assembly **106** from the latch receiver **122** mounted on latch bollard **108**. With the operator's hand(s) still on the handle **114**, the operator can pivotally move the horizontal center member assembly **106** from closed blocked passageway to open unblocked passageway.

[0044] Certain embodiments also include an interlock with system **100** for added safety. The interlock uses a magnetic switch **130** and magnet **131** for operation. In the

exemplary embodiment, the switch **130** is a magnetic reed switch. There are two techniques that may be used to connect the interlock of the system **100** with various other types of dock equipment. Either technique may be used individually or both techniques may be used simultaneously within a single system **100**.

[0045] The first technique utilizes an interlock with the latch side of the system **100**. In this embodiment, the switch **130** is located in the latch receiver **122** and the majority of the associated interlock wiring **132** is contained inside the latch bollard **108** to protect the interlock wiring **132** from damage from material being moved and from motorized goods-handling devices. The magnet **131** is mounted in the latch **121**. This setup on the latch side of the system **100** electrically communicates with another piece of dock equipment, indicating that the center member **106** at a specific position relative to the latch receiver **122**.

[0046] In the exemplary embodiment of FIG. **6***a*, this position is a closed and latched position. The magnet **131** on the latch **121** when in the proper closed latched position will trigger switch **130** located precisely in the area to send an electrical signal to the other piece of dock equipment indicating that the center member **106** is indeed in the closed, latched position. A non-limiting example would be communicating with a truck restraint (not shown). The truck restraint would not be operable unless the center member **106** was in the closed, latched position. This would prevent the truck from leaving dock with the center member **106** in an open position, resulting in possible personnel injury and material damage.

[0047] The second technique utilizes an interlock on the pivot side of the system **100**. The switch **130** is mounted on pivot bollard **107** and the associated interlock wiring **132** is again contained inside the pivot bollard **107**. The magnet **131** is mounted to a portion of the center member **106**. The magnet **131** is positioned on the center member **106** to trigger the switch **130** when the center member **106** is in a specific rotational position relative to the pivot bollard **107**. This position may be fully open, fully closed, or partially open.

[0048] In the exemplary embodiment of FIG. **6***b*, the magnet **131** is mounted to the receiving plate **119**. This exemplary interlock technique performs essentially the opposite of the first exemplary technique. Whereas the first technique tells if center member **106** is closed and latched, this interlock technique tells if the center member **106** is fully open. A non-limiting example would be communicating with dock leveler **103**. The dock leveler **103** would not be able to operate unless the center member **106** is in the fully open position. This prevents the dock leveler **103** from raising and contacting the center member **106** if the center member **106** is in the area over the dock leveler **103**, preventing damage to the dock leveler **103** and center member **106**.

[0049] In the foregoing description, certain terms have been used for brevity, clearness, and understanding. No unnecessary limitations are to be inferred therefrom beyond the requirement of the prior art because such terms are used for descriptive purposes and are intended to be broadly construed. The different configurations, systems, and method steps described herein may be used alone or in combination with other configurations, systems and method steps. It is to be expected that various equivalents, alternatives and modifications are possible within the scope of the appended claims.

We claim:

1. A gate safety barrier system, comprising:

a pivot bollard positioned on a side of a passageway opposite a latch bollard, wherein a center member assembly is pivotally mounted to the pivot bollard such that the center member assembly is selectively movable between a closed configuration blocking the passageway and an open configuration unblocking the passageway,

the center member assembly pivotally mounted to the pivot bollard by at least one hinge pin extending through at least one hinge support bracket and at least one pin connection such that rotation of the center member assembly relative to the pivot bollard is in a horizontal plane,

wherein the at least one hinge support bracket is connected to the pivot bollard on a side of the pivot bollard opposite the passageway at a −180-degree angle to a longitudinal axis of the passageway and the at least one pin connection is connected to the center member assembly,

wherein the center member assembly comprises a left member pivotally connected to a right member with a center hinge such that rotation of the left member relative to the right member is in a horizontal plane.

2. The system of claim **1**, wherein the inner surface of the at least one pin connection conforms to an outer surface of the pivot bollard.

3. The system of claim **1**, wherein the inner surface of the at least one pin connection has an L-shaped configuration.

4. The system of claim **1**, further comprising a covering which covers the center hinge.

5. The system of claim **4**, wherein the covering also covers at least part of the left member and at least part of the right member around the center hinge.

6. The system of claim **4**, wherein the covering comprises a flexible material attached to at least one of the center hinge, the left member, or the right member.

7. The system of claim **4**, wherein the covering comprises multiple sections of a metallic material.

8. The system of claim **4**, wherein the covering comprises a semi-rigid material fastened to at least one of the left member or the right member.

9. The system of claim **1**, further comprising at least one latch connected to the latch bollard and at least one corresponding latch receiver connected to the center member assembly, wherein the at least one latch will fully seat into the at least one corresponding latch receiver when the center member assembly is moved to the closed configuration blocking the passageway.

10. The system of claim **9**, further comprising at least one latch actuator operably connected to the latch, wherein actuation of the at least one latch actuator disengages the at least one latch from the at least one corresponding latch receiver.

11. The system of claim **1**, further comprising at least one latch connected to the center member assembly and at least one corresponding latch receiver connected to the latch bollard.

12. The system of claim **11**, further comprising at least one latch actuator operably connected to the latch, wherein

actuation of the at least one latch actuator disengages the at least one latch from the at least one corresponding latch receiver.

13. The system of claim **12**, wherein the at least one latch actuator is connected to at least one handle, wherein the at least one handle is connected to the horizontal center member assembly.

14. The system of claim **11**, further comprising at least one latch containment bracket is mounted on the horizontal center member assembly over the at least one latch.

15. The system of claim **11**, further comprising at least one actuator link connecting the at least one latch and the at least one latch actuator.

16. The system of claim **1**, further comprising one of a detent and a receiving plate mounted on the pivot bollard and the other of the detent and the receiving plate fixed to the horizontal center member assembly, the receiving plate having at least one receiving feature capable of receiving the detent.

17. The system of claim **16**, wherein the at least one receiving feature is located on the receiving plate such that when the detent is located within the receiving feature, the horizontal center member assembly is in at least one configuration selected from: a closed configuration blocking the passageway, an open configuration unblocking the passageway, or a partially open configuration located between the closed configuration and the open configuration.

18. The system of claim **16**, wherein the detent has a ball detent configuration

19. The system of claim **1**, further comprising an interlock having a switch located in a latch receiver and a magnet is mounted in a latch, wherein the magnet is positioned on the latch to trigger the switch when the latch is in a specific position relative to the latch receiver.

20. The system of claim **1**, further comprising an interlock having a switch mounted on the pivot bollard and a magnet mounted to the horizontal center member assembly, wherein the magnet is positioned on the horizontal center member assembly to trigger the switch when the horizontal center member assembly is in a specific rotational position relative to the pivot bollard.

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