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SAFETY GATE FOR LOADING DOCK

[0001] This claims the benefit of US Provisional Patent Application Serial No. 62/748,753, filed October 22, 2018 and US Provisional Patent Application Serial No. 62/756,616, filed November 7, 2018, each of which is hereby incorporated by reference in its entirety.

Background of the Invention

[0002] This invention relates generally to industrial loading docks and more particularly to a safety gate for such a dock.

[0003] Many industrial and other buildings have a doorway with a loading dock to facilitate transferring cargo between a truck and the building. A loading dock is a platform that is generally at the same elevation as a bed of the truck or its trailer. A loading dock or loading bay is an area of a building where road or rail vehicles are loaded and unloaded. Loading docks are commonly found on commercial and industrial buildings, and warehouses in particular.

[0004] Loading docks may be exterior, flush with the building facade, or fully enclosed. They are part of a facility's service or utility infrastructure, typically providing direct access to staging areas, storage rooms, and freight elevators within the building.

[0005] The dock may also include a dock leveler, which is a vertically movable ramp that compensates for a height differential that may exist between the platform and the truck bed. Dock levelers may also provide a bridge across which personnel and material handling equipment can travel between the platform and the truck.

[0006] There are inherent dangers associated with loading docks because loading docks typically are raised several feet with respect to the outside ground surface, roadway or railway and, moreover, trains, trucks and semi-trailers are frequently moving immediately outside of the loading dock area. Because the doors or passageways at loading docks involve high traffic situations to enable the loading or unloading of parked vehicles, forklifts and personnel should be prevented from accidentally falling off the loading dock when a parked vehicle is not present. Forklifts can travel at high rates of speed while being difficult to handle and steer, particularly for inexperienced

operators. Forklifts are also very heavy, which combined with their speed, results in large amounts of momentum and kinetic energy, making such forklifts difficult to stop.

[0007] For protection against weather and theft, the doorway of the building typically includes a manual or power operated multi-sectional dock door. Doors for loading docks usually open and close by moving vertically so as not to interfere with the rear of the truck or interfere with cargo and activity just inside the doorway on the loading dock.

[0008] During a loading or unloading operation the truck body will enclose the doorway in the dock, but when a loading dock operation is not taking place, it is often desired to maintain the dock door in an open position to provide increased ventilation or light in the building.

[0009] When there is no truck at the dock and the weather is mild, the dock door may be left open to help ventilate the building with fresh outside air. Leaving the dock door open, unfortunately, increases the risk of personnel or material handling or other equipment inside the building from accidentally falling off the edge of the dock's platform and through the open doorway to the driveway. In addition, the dock door being left open decreases building security due to entrance of unauthorized personnel or employee theft via the unsecured doorway.

[0010] Additionally, various OSHA standards (i.e., standard 1910.28 entitled Duty to have fall protection and falling object protection) may also mandate more than a simple chain or other device draped across the doorway to deter personnel and equipment from accidentally falling through the open loading dock doorway. However, OSHA compliant safety barriers should not be too intrusive to the working environment, too complex for easy use or too costly to deter implementation.

Summary of the Invention

[0011] These and other shortcomings in the prior art have been addressed by this invention, which in one embodiment is a safety gate for a loading dock. The safety when in a down or blocking position covers an opening at a loading dock bay. Typically, the loading dock bay has a dock floor which is elevated relative to the exterior ground. The safety gate is movable between the down blocking position and an upper non-blocking

position along a safety gate track system. The safety gate may best coupled to a safety gate counterbalance system positioned at an upper end of the safety gate track system. The safety gate counterbalance system may include an elongate shaft with a counterbalance spring mounted thereon and opposing drums adjacent each end of the shaft. Cables extend around and downwardly from each drum to a lower edge of the safety gate to assist in movement of the safety gate along the track system to and between the blocking and non-blocking positions.

[0012] The safety gate 12 may be installed in conjunction with a dock door which is movable between a downward closed position and upward open position along a dock door track system which includes a pair of track sections spaced on opposite ends of the dock door as is well known in the art. The dock door may include a number of individual door sections which extend laterally between the opposed track sections. The door sections may be hinged together as is well known in the art. A dock door counterbalance system may be coupled to the dock door to assist in movement of the dock door to and between the closed and open positions.

[0013] One advantage of the safety gate according to various embodiments of this invention is that the safety gate may be installed upon original construction of the warehouse and loading dock bay or the safety gate may be added as a retrofit addition to a loading dock bay. As such, the safety gate and associated safety gate track system is mounted and installed forward of the dock door and dock door track system. The safety gate track system may be secured directly to the wall by associated brackets similar to the mounting of the dock door track system to the wall.

[0014] Various embodiments of the safety gate according to this invention may include a safety gate latch system which releasably secures the safety gate in the down or blocking position. Another feature of various embodiments of this invention is a door keeper mechanism which prevents downward travel of the dock door to the floor when the safety gate is in the blocking position thereby avoiding potential injury or damage to any objects positioned between the lower edge of the dock door and the upper edge of the safety gate.

Brief Description of the Drawings

[0015] The above-mentioned and other features and advantages of this invention, and the manner of attaining them, will become more apparent and the invention itself will be better understood by reference to the following description of embodiments of the invention taken in conjunction with the accompanying drawings, wherein:

[0016] Fig. 1 is a perspective view of one embodiment of a safety gate in conjunction with a sectional dock door covering a dock bay opening according to this invention;

[0017] Fig. 2 is a side elevational view of the embodiment shown in Fig. 1;

[0018] Fig. 3 is an enlarged view of the safety gate mounted on a track system of the embodiment shown in Figs. 1-2;

[0019] Fig. 4 is a perspective view of one embodiment of the safety gate according to this invention;

[0020] Fig. 4A is a front elevational view of another embodiment of the safety gate according to this invention;

[0021] Fig. 5 is an enlarged and partially exploded view of a safety latch mechanism mounted on the safety gate adjacent a track section according to one embodiment of this invention; and

[0022] Figs. 6-8 are each side elevational partial cross-sectional views of distinct embodiments of a door keeper safety apparatus amounted atop a safety gate to inhibit closing of the dock door according to this invention.

Detailed Description of the Invention

[0023] Referring to Fig. 1, one embodiment of a safety gate installation 10 is shown. The safety gate installation 10 includes a safety gate 12 which is shown in Fig. 1 in a down or blocking position covering an opening 14 at a loading dock bay 16. The opening 14 is formed in a wall 18 of a warehouse or other facility. Typically, as shown in Fig. 2, the loading dock bay 16 has a dock floor 20 which is elevated relative to the exterior ground. On an exterior side of the wall 18 at the loading dock bay 16, a pad 22 may be positioned below the dock opening 14 for contact by a vehicle or trailer being loaded or unloaded when positioned at the loading dock bay 16.

[0024] Referring once again to Figs. 1 and 2, the safety gate 12 is movable between the down blocking position and an upper non-blocking position along a safety gate track system 24. The safety gate track system 24 includes track sections 26 spaced on opposite sides of the safety gate 12 and the loading dock bay opening 14. The safety gate 12 is coupled to a safety gate counterbalance system 28 positioned at an upper end of the safety gate track system 24 in the embodiment of Figs. 1 and 2. The safety gate counterbalance system 28 includes an elongate shaft 30 with a counterbalance spring 32 mounted thereon and opposing drums 34 adjacent each end of the shaft 30. Cables 36 extend around and downwardly from each drum 34 to a lower edge of the safety gate 12 to assist in movement of the safety gate 12 along the track system 24 to and between the blocking and non-blocking positions.

[0025] As shown in Figs. 1 and 2, the safety gate 12 is installed in conjunction with a dock door 40 which is movable between a downward closed position and upward open position along a dock door track system 42 which includes a pair of track sections 44 spaced on opposite ends of the dock door 40 as is well known in the art. The dock door 40 may include a number of individual door sections 46 which extend laterally between the opposed track sections 44. The door sections 46 may be hinged together as is well known in the art. A dock door counterbalance system 48 is also coupled to the dock door 40 to assist in movement of the dock door 40 to and between the closed and open positions. The dock door counterbalance system 48 includes a shaft 50 extending between opposite drums 52 with a counterbalance spring 54 mounted on the shaft and cables 56 extending from the drums 52 to the lower end of the dock door 40 as is well known by one of ordinary skill in the art. The counterbalance systems 28, 48 for the safety gate 12 and the dock door 40 may each be a torsion spring system, an extension spring system or other type of counterbalance system as is well known in the art.

[0026] The counterbalance system 28 for the safety gate 12 may further have a cable tensioning device attached to the cables 56 located between the drums 52 and the lower end of the safety gate 12. The cables 56 may not be subjected to even or constant tension while the safety gate is being moved between a downwardly blocking position and an upward non-blocking position. The safety gate 12 may also be subject to a

downward force when in the downward blocking position as individuals or items may lean or rest against the top of the safety gate 12 releasing the tension on the cables 56 and causing the cables 56 to disengage from the drums 52. Suitable cable tensioning devices may include those disclosed in US Patent Application Publication No.

US2003/0178158; US Patent No. 3,460,602; Canadian Patent No. 1,130,191; US Patent No. 3,412,780 and US Patent No. 3,160,200, each of which is incorporated herein by reference. A suitable cable tensioning device may comprise an enclosed drawbar spring or a series of drawbar springs attached to the cables 56. The enclosure for the drawbar spring or series of drawbar springs should be of a length to allow for the extension of the drawbar spring or series of springs while preventing items from being caught between the extended coils of the drawbar spring. The location of the enclosed drawbar spring is preferably located at a location along the cables 56 between the drums 52 and the lower end of the safety gate 12 such that the enclosed drawbar spring does not interfere with or inhibit any of the brackets 70, safety gate track system 24, or any surrounding structures to the cables 56 and the cables travel path.

[0027] The safety gate 12 according to this embodiment of the invention includes two safety gate sections 60 stacked one on top of the other. Each safety gate section 60 includes upper and lower rails 62 extending generally horizontally and one or more intermediate stiles 64 extending vertically between the upper and lower rails 62 of each safety gate section 60. End stiles 66 are located at the lateral end of each safety gate section 60 adjacent the associated track section 26. The bottom safety gate section 60 may include an astragal 68 mounted on the lower edge of the bottom rail 62 to seat the safety gate 12 on the dock floor 20.

[0028] One advantage of the safety gate 12 according to various embodiments of this invention is that the safety gate 12 may be installed upon original construction of the warehouse and loading dock bay 16, or the safety gate 12 may be added as a retrofit addition to a loading dock bay 16. As such, the safety gate 12 and associated safety gate track system 24 is mounted and installed forward of the dock door 40 and dock door track system 42 as is shown in Figs. 1 and 2. The safety gate track system 24 may be

secured directly to the wall 18 by associated brackets 70 similar to the mounting of the dock door track system 42 to the wall 18.

[0029] As is shown in Figs. 1 and 2, the lower portions of the track systems 24, 42 for the safety gate 12 and dock door 40 are generally vertical and parallel to one another. However, the upper portions of the track sections 26, 44 are angled away from the warehouse wall 18. In some embodiments, the angle of the upper portion of the dock door track system 42 is at less of an angle relative to the wall 18 than the upper portion of the safety gate track system 24 which is at a greater angle from the wall 18 as shown most particularly in Fig. 2.

[0030] Referring to Figs. 4 and 4A, one embodiment of the safety gate 12 according to this invention is shown. In this embodiment, the upper safety gate section 60 is coupled to the lower safety gate section 60 by hinges 72 mounted to the aligned end stiles 66 of the two safety gate sections 60. As shown particularly in Fig. 4A, the hinges 72 which join the upper safety gate section 60 to the lower safety gate section 60 each include an upper and a lower hinge leaf 74 mounted to the adjacent rails 62 of the safety gate section 60 and aligned with the end stiles 66 of those safety gate sections 60. Each hinge 72 also includes a roller 76 mounted on a roller shaft 78 generally aligned with a pivot axis of the hinge 72. The roller shaft 78 is mounted to upwardly oriented tabs 80 on the hinge leaves 74 as is well known by one of ordinary skill in the art.

[0031] Additional rollers 82 are mounted to roller brackets 84 on the end stiles 66 as is shown particularly in Figs. 4 and 4A. The rollers 76, 82 are captured within the safety gate track sections 26 to assist in movement of the safety gate 12 from the downwardly blocking position to the upward non-blocking position.

[0032] As shown particularly in Figs. 4, 4A and 5, various embodiments of the safety gate 12 according to this invention include a safety gate latch system 90 which releasably secures the safety gate 12 in the blocking position. The safety gate latch system 90 includes latch assemblies 92 at the lateral side ends of the safety gate 12 adjacent the respective safety gate track sections 26. The opposing latch assemblies 92 are joined together by a cable 94 which spans the upper rail 62 of the upper safety gate section 60 as shown particularly in Fig. 4A. Cable guides 96 may be mounted to the rail

62 to capture the cable 94 and allow it to move laterally through the guide 96. A pull handle 98 may be provided on the cable 94 for a user to grasp the cable 94 and pull it to thereby release the attached latch assemblies 92 and allowing the safety gate 12 to move upwardly from the blocking position. Each latch assembly 92 includes a base plate 100 screwed or bolted to the upper rail 62 as shown in Fig. 5. The base plate 100 includes a pair of upwardly turned tabs 102 oriented generally perpendicular to the base plate 100. A pivot tube 104 is mounted to the tabs 102 to allow a latch 106 to pivot about the tube 104. The latch 106 includes a pair of tabs 108 mounted generally parallel to the tabs 102 of the base plate 100. The pivot tube 104 extends through the tabs 102 of the base plate 100 and the tabs 108 of the latch 106 to allow for pivotal movement of the latch 106 relative to the base plate 100.

[0033] A spring 110 is mounted around the pivot tube 104 to bias the latch 106 outwardly so that an extension 112 projecting from the latch 106 is generally parallel to the base plate 100. However, when the cable 94 is pulled, the latch 106 and extension 112 are pivoted away from the base plate 100. The extension 112 engages within a seat 114 on a latch keeper 116 mounted on the adjacent safety gate track section 26. The seat 114 is defined between a pair of tabs 118 extending from the latch keeper 116. When the extension 112 is captured within the seat 114, the safety gate 12 is releasably secured in the blocking position. To move the safety gate 12 from the blocking position, an operator pulls the cable 94 via the pull handle 98 thereby pulling the extensions 112 and pivoting them out of the respective seats 114 to allow for free movement of the safety gate 12 along the safety gate track system 24.

[0034] Another feature of various embodiments of this invention is shown in Figs. 6-8, each of which show alternative embodiments of a door keeper mechanism 112. The door keeper mechanism 112 prevents downward travel of the dock door 40 to the floor 20 when the safety gate 12 is in the blocking position thereby avoiding potential injury or damage to any objects positioned between the lower edge of the dock door 40 and the upper edge of the safety gate 12.

[0035] The door keeper or safety mechanism 120 embodiment shown in Fig. 6 includes a mount 122 secured to the upper rail 62 of the top safety gate section 60. A

door keeper arm 124 is pivotally secured to the mount 122 as shown in Fig. 6. The mount 122 includes a barrel or circular-shaped member 126 which includes a pivot pin 128 of the mount 122 to pivot the arm 124 toward and away from the dock door track section 44. The door keeper mechanism 120 includes a generally linear arm 124 with a stop 130 mounted at a terminal end of the arm 124. The stop 130 is oriented generally perpendicular to the arm 124. The door keeper arm 124 pivots about a pivot axis which is generally parallel to the upper rail 62 of the safety gate section 60. When the door keeper mechanism 120 is to be activated, an operator may pivot the arm 124 and stop 130 in the direction of arrow A as shown in Fig. 6 so that the stop 130 is positioned relative to the track section 44 of the dock door 40 in a safety position to block or inhibit movement of the dock door 40 downwardly toward the dock floor 20. The stop 130 of the door keeper mechanism 120 may engage a lower roller bracket 134 or the roller 132 mounted on the roller bracket 134 at the lower door section 44 of the dock door 40 to thereby stop the downward movement of the dock door 40. The length of the arm 124 of the door keeper mechanism 120 may be designed for a particular application. A longer door keeper arm 124 will allow for interference of the movement of the dock door 40 at a higher elevation from the dock floor 20 thereby providing a bigger space between the bottom edge of the dock door 40 and the upper edge of the safety gate 12 when the door keeper mechanism 120 is engaged. When the door keeper mechanism is pivoted away from the dock door 40 it is in a retracted position.

[0036] An alternative embodiment of the door keeper mechanism 120 according to various embodiments of this invention is shown in Fig. 7. The embodiment shown in Fig. 7 includes the mount 122 as well as the arm 124 and the stop 130 located at the terminal end of the arm 124. The arm 124 is mounted for rotation about a pivot axis which is generally perpendicular to the top rail 62 of the safety gate 12. To activate the door keeper mechanism 120 of Fig. 7, an operator rotates the arm 124 in the direction of arrow B as shown in Fig. 7 so that the stop 130 is positioned relative to the track section 44 of the dock door 40 to inhibit further downward movement of the dock door 40.

[0037] A still further alternative embodiment of the door keeper mechanism 120 according to this invention is shown in Fig. 8. The mount 122 of the embodiment of Fig.

8 is similar to the mount 122 of the embodiment shown in Fig. 6. The arm 124 of the door keeper mechanism 120 of the embodiment in Fig. 8 pivots in the direction of arrow C to engage the dock door 40. The axis of rotation of the arm 124 is generally parallel to the top rail 62 of the safety gate 12. The stop 130 located at the terminal end of the arm 124 has a generally L-shaped configuration with an upstanding flange 131 in the embodiment of Fig. 8 to engage the roller 132 and/or roller bracket 134 of the bottom section of the dock door 40. Here again, the dimensions and configuration of the arm 124 and door keeper mechanism 120 may be adjusted to provide the desired gap between the safety gate 12 and the dock door 40 when the door keeper mechanism 120 is engaged.

[0038] The safety gate 12 provides a blocking obstruction to prevent the inadvertent passage through the opening 14 of the dock bay 16 while the dock door 40 is open. The construction of the safety gate 12 embodiments shown herein includes an open network of rails and stiles to provide for light and air flow between the exterior and the interior of the dock bay 16 as desired. However, various panels or glazing may be included in alternative embodiments of the safety gate 12 according to this invention.

[0039] From the above disclosure of the general principles of this invention and the preceding detailed description of at least one embodiment, those skilled in the art will readily comprehend the various modifications to which this invention is susceptible. Therefore, we desire to be limited only by the scope of the following claims and equivalents thereof.

[0040] We claim:

1. An improvement for a safety gate for use with a loading dock having a dock floor and a dock opening, the safety gate having a supporting track system including a pair of spaced track sections, each disposed along a side of the loading dock, a safety gate mounted for movement on the supporting track system between an upper storage position where the safety gate is located adjacent an upper end of the loading dock and a lower blocking position where the safety gate extends across the loading dock, the safety gate being positioned relative to a dock door which is moveable to and between open and closed positions relative to the dock opening, the improvement comprising:

a safety mechanism which prevents the dock door from moving downward toward the closed position when the safety gate is in the blocking position so as to prevent injury and damage to an individual and object positioned between an upper edge of the safety gate and a lower edge of the dock door.

2. The improvement of claim 1 wherein the safety mechanism is mounted atop the safety gate.

3. The improvement of claim 1 wherein the safety mechanism further comprises:
an arm which is pivotally mounted proximate to the top of the safety gate for movement to and between a safety position which inhibits downward movement of the dock door and a retracted position which does not inhibit downward movement of the dock door.

4. The improvement of claim 3 wherein a pivot axis of the safety mechanism is generally parallel to a direction of movement of the dock door.

5. The improvement of claim 3 wherein a pivot axis of the safety mechanism is generally perpendicular to a direction of movement of the dock door.

6. The improvement of claim 1 wherein the safety mechanism intersects a portion of a track system to which the dock door is mounted for movement between the open and closed positions.
7. The improvement of claim 1 wherein the safety mechanism has a generally L-shaped member.
8. An improvement for a safety gate for use with a loading dock having a dock floor and a dock opening, the safety gate having a supporting track system including a pair of spaced track sections, each disposed along a side of the loading dock, a safety gate mounted for movement on the supporting track system between an upper storage position where the safety gate is located adjacent an upper end of the loading dock and a lower blocking position where the safety gate extends across the loading dock, the safety gate being positioned relative to a dock door which is moveable to and between open and closed positions relative to the dock opening, the improvement comprising:
 - a safety mechanism mounted atop the safety gate which prevents the dock door from moving downward toward the closed position when the safety gate is in the blocking position so as to prevent injury and damage to an individual and object positioned between an upper edge of the safety gate and a lower edge of the dock door; and
 - the safety mechanism including a generally L-shaped arm which is pivotally mounted proximate to the top of the safety gate for movement to and between a safety position which inhibits downward movement of the dock door and a retracted position which does not inhibit downward movement of the dock door;
 - wherein a pivot axis of the safety mechanism is one of generally parallel and generally perpendicular to a direction of movement of the dock door;
 - wherein the safety mechanism intersects a portion of a track system to which the dock door is mounted for movement between the open and closed positions.

9. A safety gate arrangement for installation relative to an opening at a dock elevated above a ground surface exterior to the opening, the opening being selectively closed by a dock door movable on a track system to and between a closed position closing the opening and an open position allowing for access through the opening, the safety gate arrangement comprising:

at least one safety gate section extending across the opening when in a blocking position to inhibit access through the opening, the at least one gate section being movable from the blocking position to allow for access through the opening; and

a safety mechanism which prevents the dock door from moving downward toward the closed position when the safety gate is in the blocking position so as to prevent injury and damage to an individual and object positioned between an upper edge of the at least one safety gate section and a lower edge of the dock door.

10. The safety gate arrangement of claim 9 wherein the safety mechanism is mounted atop the at least one safety gate section.

11. The safety gate arrangement of claim 9 wherein the safety mechanism further comprises:

an arm which is pivotally mounted proximate to the top of the at least one safety gate section for movement to and between a safety position which inhibits downward movement of the dock door and a retracted position which does not inhibit downward movement of the dock door.

12. The safety gate arrangement of claim 11 wherein a pivot axis of the safety mechanism is generally parallel to a direction of movement of the dock door.

13. The safety gate arrangement of claim 11 wherein a pivot axis of the safety mechanism is generally perpendicular to a direction of movement of the dock door.

14. The safety gate arrangement of claim 9 wherein the safety mechanism intersects a portion of the track system to which the dock door is mounted for movement between the open and closed positions.

15. The safety gate arrangement of claim 9 wherein the safety mechanism has a generally L-shaped member.

16. A safety gate arrangement for installation relative to an opening at a dock elevated above a ground surface exterior to the opening, the opening being selectively closed by a dock door movable on a track system to and between a closed position closing the opening and an open position allowing for access through the opening, the safety gate arrangement comprising:

at least one safety gate section extending across the opening when in a blocking position to inhibit access through the opening, the at least one gate section being movable from the blocking position to allow for access through the opening; and

a safety mechanism mounted atop the at least one safety gate section which prevents the dock door from moving downward toward the closed position when the safety gate is in the blocking position so as to prevent injury and damage to an individual and object positioned between an upper edge of the at least one safety gate section and a lower edge of the dock door;

wherein the safety mechanism includes a generally L-shaped arm which is pivotally mounted proximate to the top of the at least one safety gate section for movement to and between a safety position which inhibits downward movement of the dock door and a retracted position which does not inhibit downward movement of the dock door;

wherein a pivot axis of the safety mechanism is one of generally parallel and generally perpendicular to a direction of movement of the dock door;

wherein the safety mechanism intersects a portion of the track system to which the dock door is mounted for movement between the open and closed positions.

17. A dock site having a dock floor proximate an opening in a wall and being elevated relative to a ground surface exterior to the opening, the dock site comprising:

a dock door selectively movable to and between a closed position closing the opening and an open position allowing for access through the opening;

a track system mounted to the wall proximate the opening, the dock door being mounted to the track system for movement to and between the closed and open positions;

at least one safety gate section extending across the opening when in a blocking position to inhibit access through the opening, the at least one gate section being movable from the blocking position to allow for access through the opening; and

a safety mechanism which prevents the dock door from moving downward toward the closed position when the safety gate is in the blocking position so as to prevent injury and damage to an individual and object positioned between an upper edge of the at least one safety gate section and a lower edge of the dock door.

18. The dock site of claim 17 wherein the safety mechanism is mounted atop the at least one safety gate section.

19. The dock site of claim 17 wherein the safety mechanism further comprises:

an arm which is pivotally mounted proximate to the top of the at least one safety gate section for movement to and between a safety position which inhibits downward movement of the dock door and a retracted position which does not inhibit downward movement of the dock door.

20. The dock site of claim 19 wherein a pivot axis of the safety mechanism is generally parallel to a direction of movement of the dock door.

21. The dock site of claim 19 wherein a pivot axis of the safety mechanism is generally perpendicular to a direction of movement of the dock door.

22. The dock site of claim 17 wherein the safety mechanism intersects a portion of the track system to which the dock door is mounted for movement between the open and closed positions.
23. The dock site of claim 17 wherein the safety mechanism has a generally L-shaped member.
24. A dock site having a dock floor proximate an opening in a wall and being elevated relative to a ground surface exterior to the opening, the dock site comprising:
- a dock door selectively movable to and between a closed position closing the opening and an open position allowing for access through the opening;
 - a track system mounted to the wall proximate the opening, the dock door being mounted to the track system for movement to and between the closed and open positions;
 - at least one safety gate section extending across the opening when in a blocking position to inhibit access through the opening, the at least one gate section being movable from the blocking position to allow for access through the opening; and
 - a safety mechanism mounted atop the at least one safety gate section which prevents the dock door from moving downward toward the closed position when the safety gate is in the blocking position so as to prevent injury and damage to an individual and object positioned between an upper edge of the at least one safety gate section and a lower edge of the dock door;
- wherein the safety mechanism includes an L-shaped arm which is pivotally mounted proximate to the top of the at least one safety gate section for movement to and between a safety position which inhibits downward movement of the dock door and a retracted position which does not inhibit downward movement of the dock door;
 - wherein a pivot axis of the safety mechanism is one of generally parallel and generally perpendicular to a direction of movement of the dock door;
 - wherein the safety mechanism intersects a portion of the track system to which the dock door is mounted for movement between the open and closed positions.

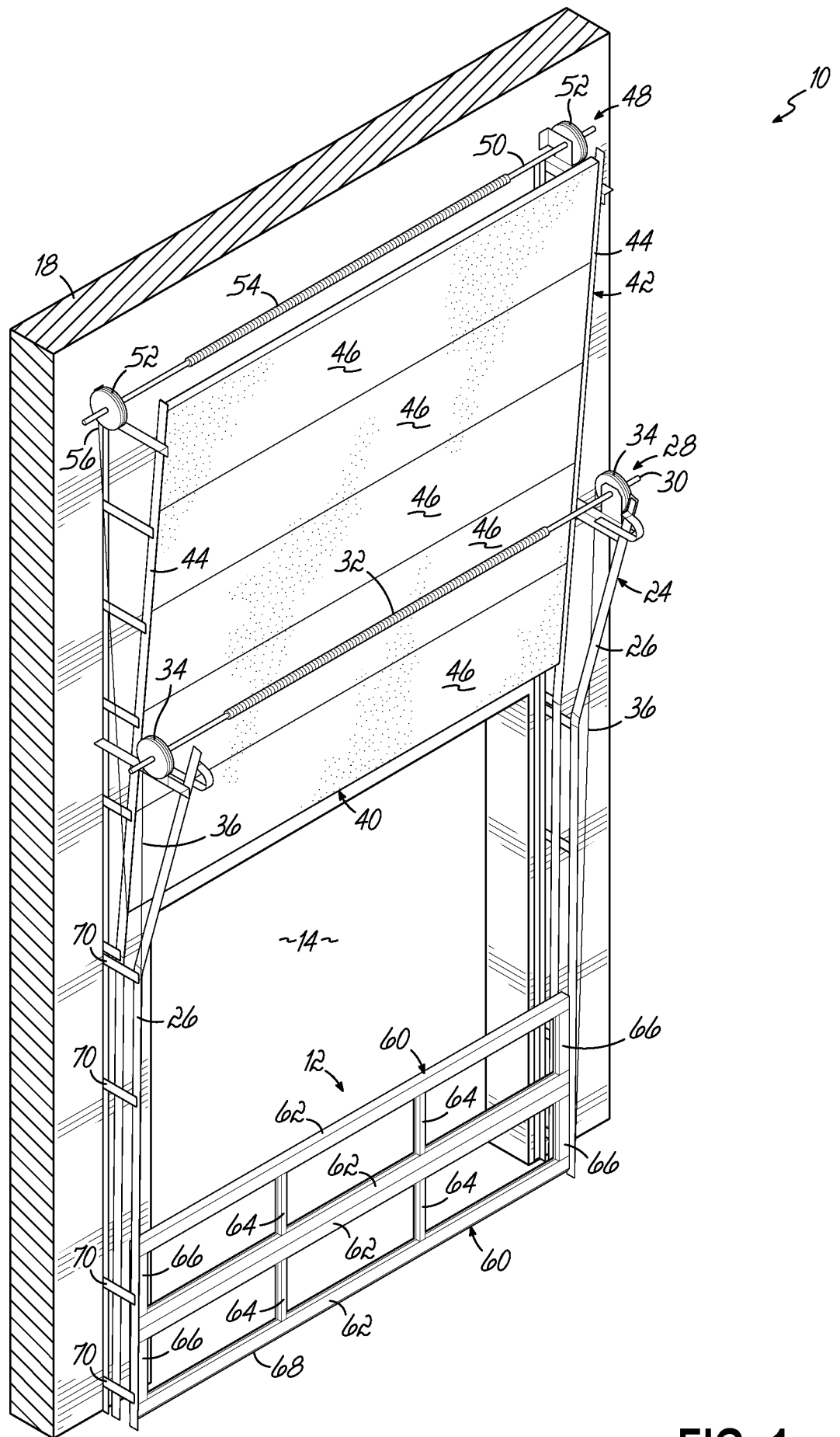


FIG. 1

SUBSTITUTE SHEET (RULE 26)

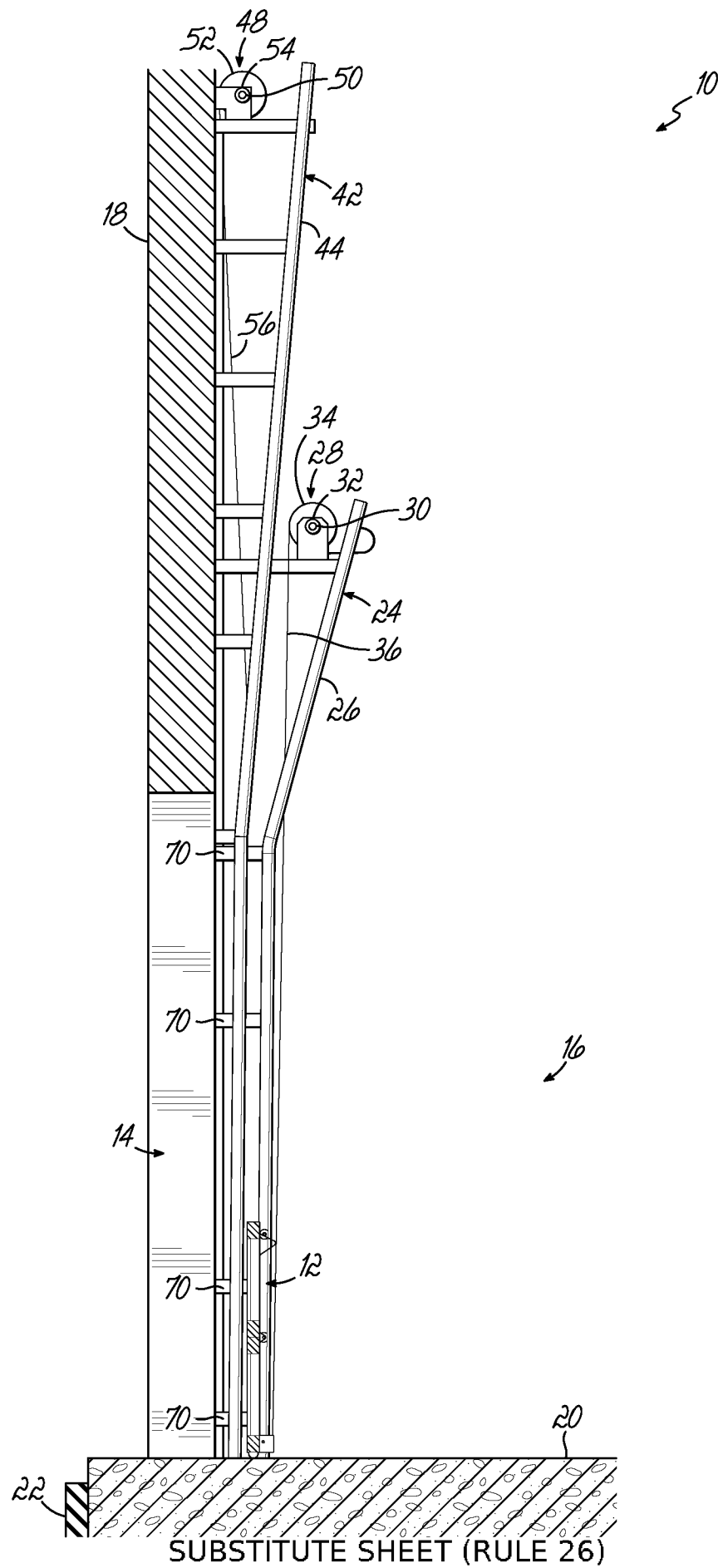


FIG. 2

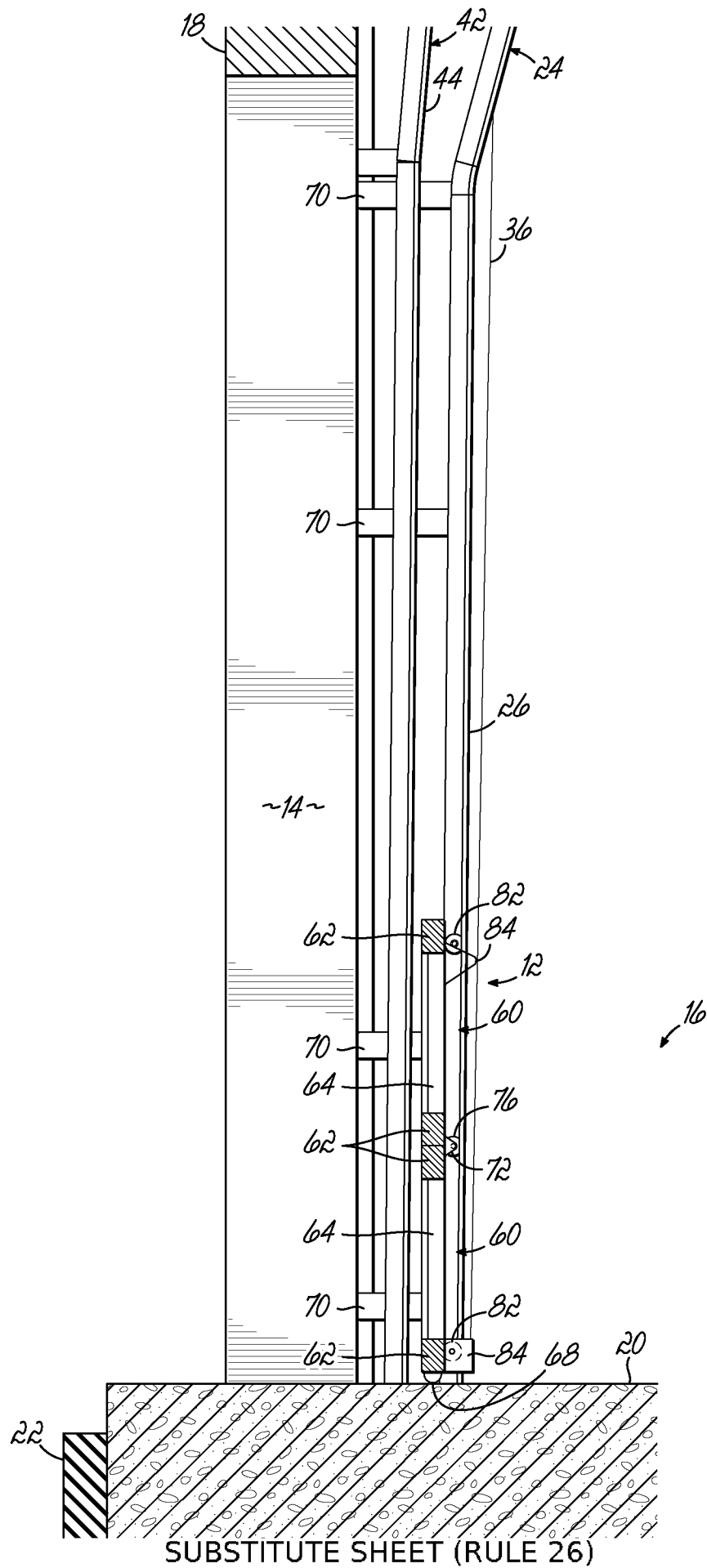


FIG. 3

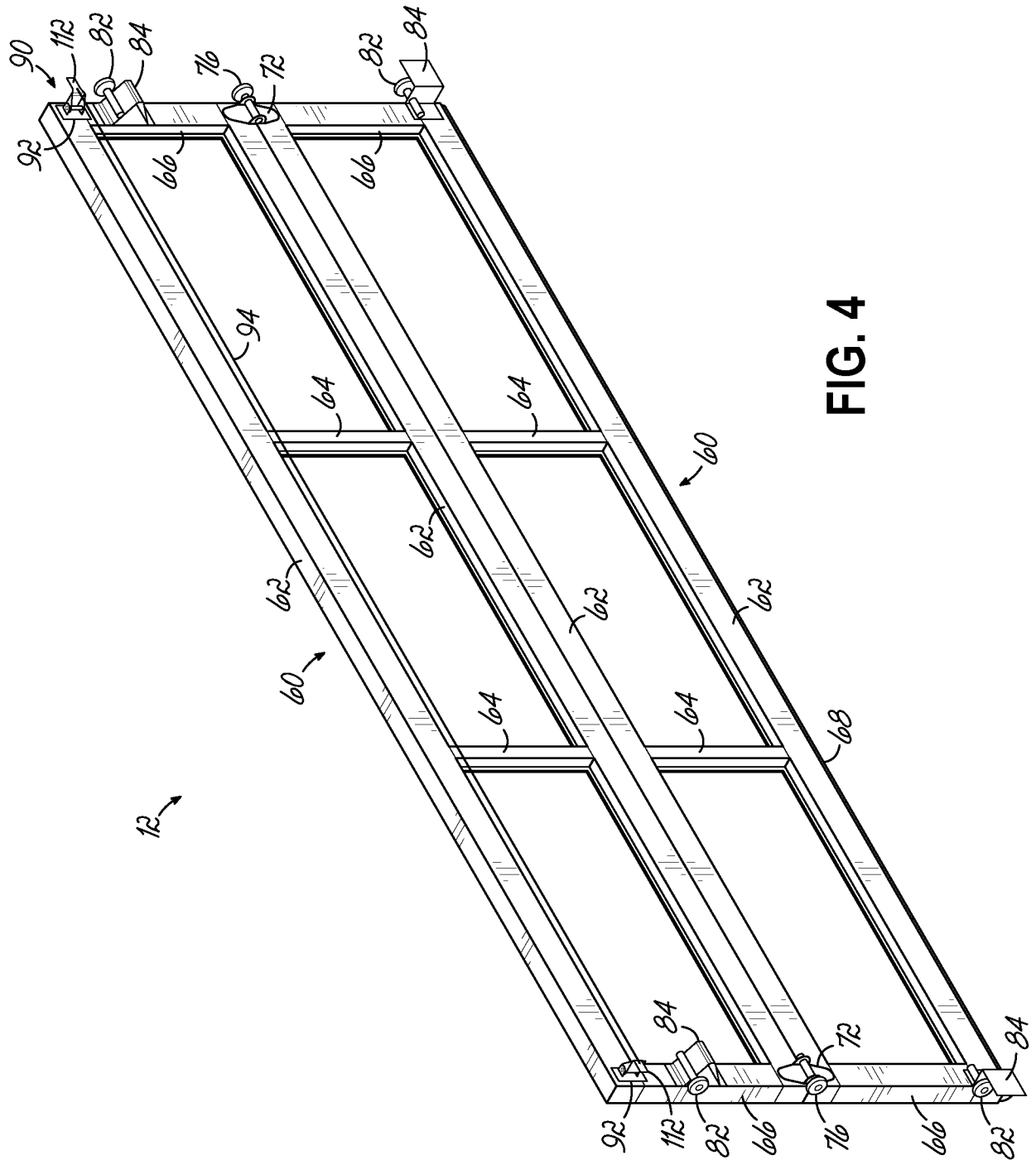


FIG. 4

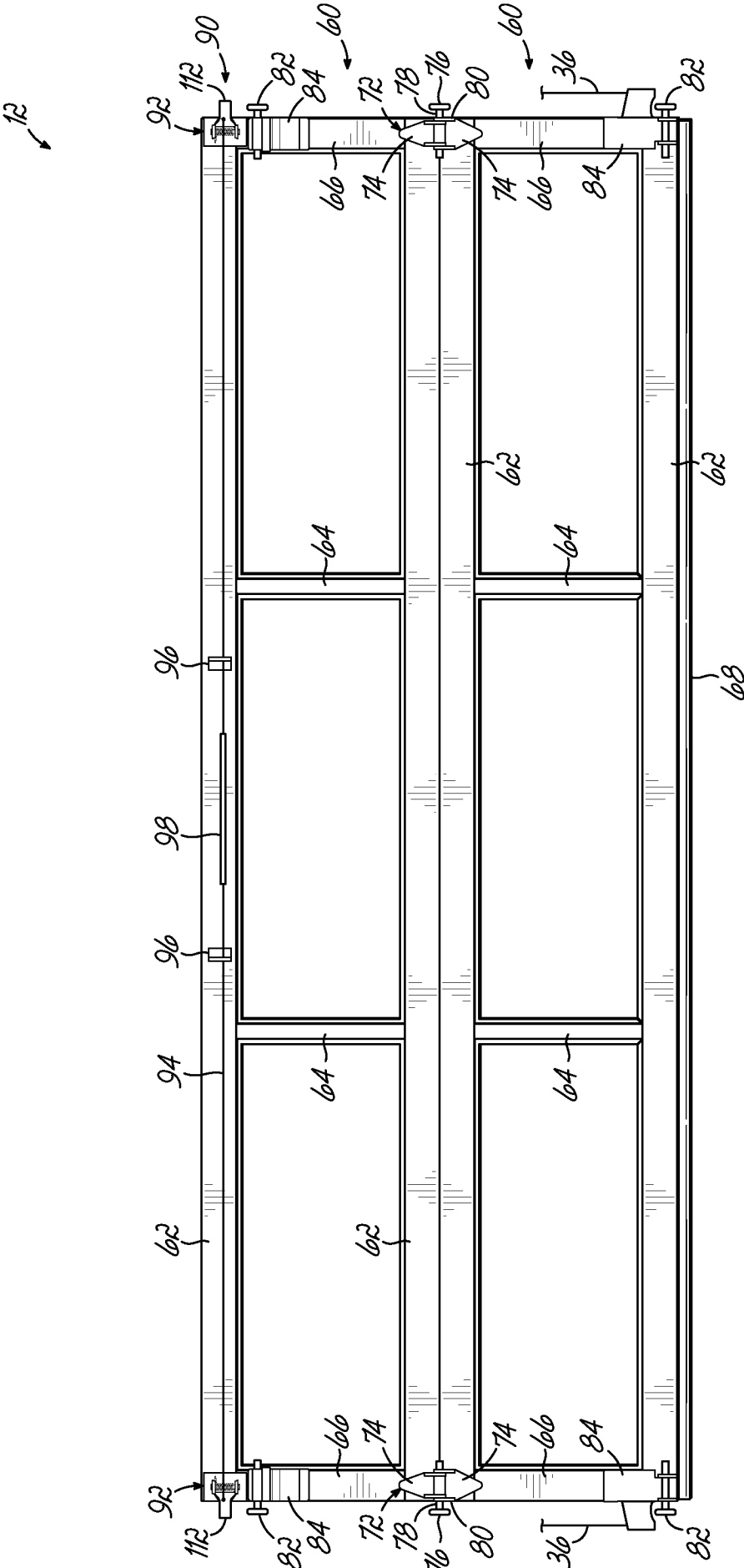
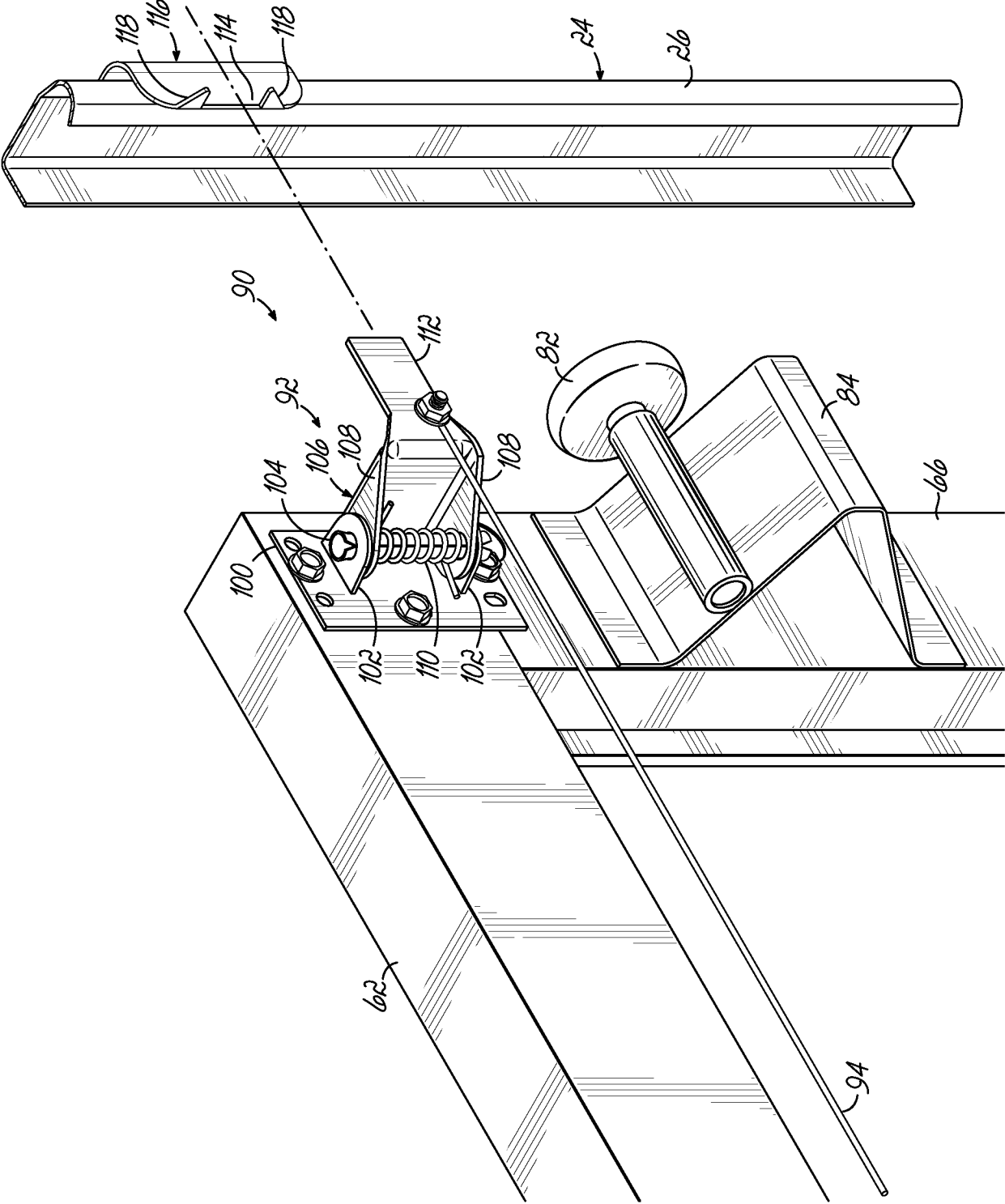


FIG. 4A

FIG. 5



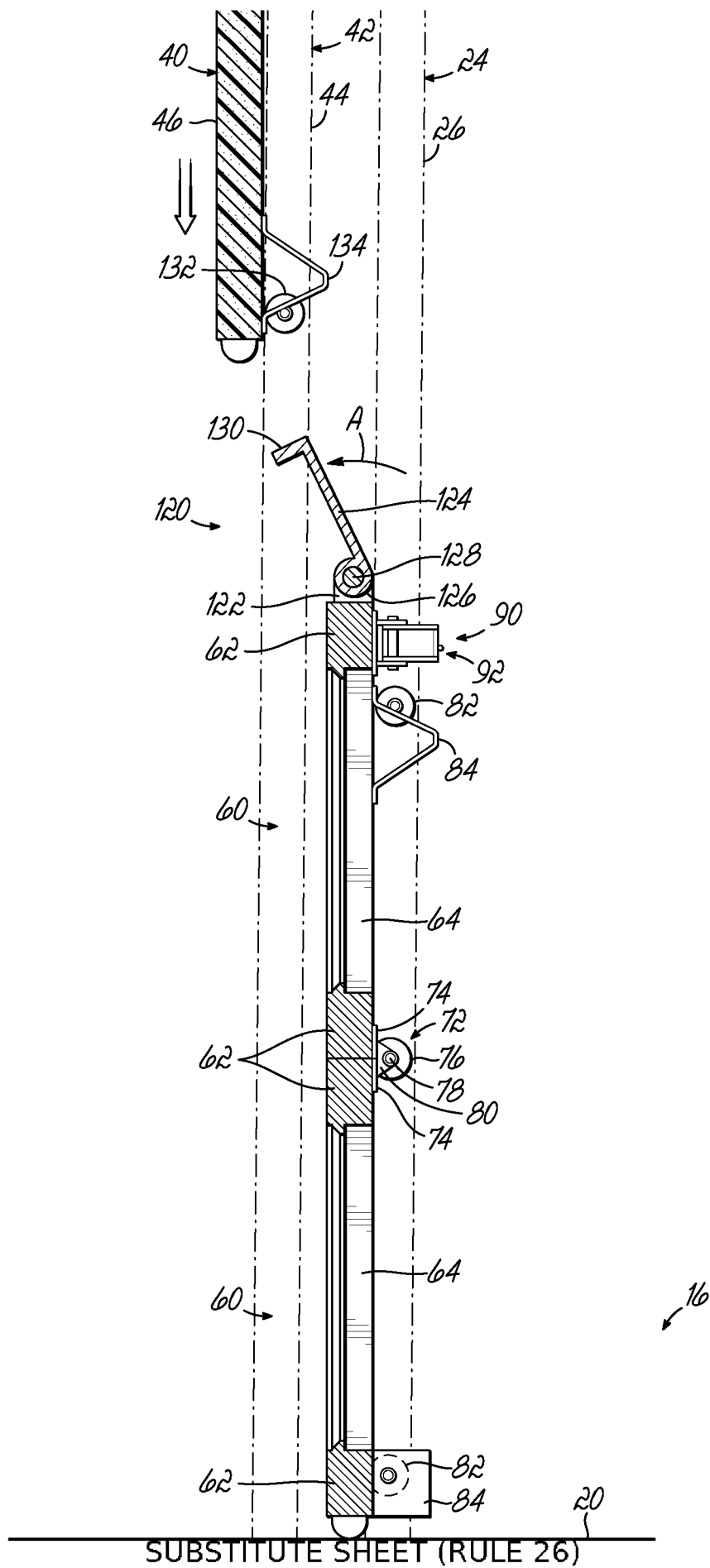


FIG. 6

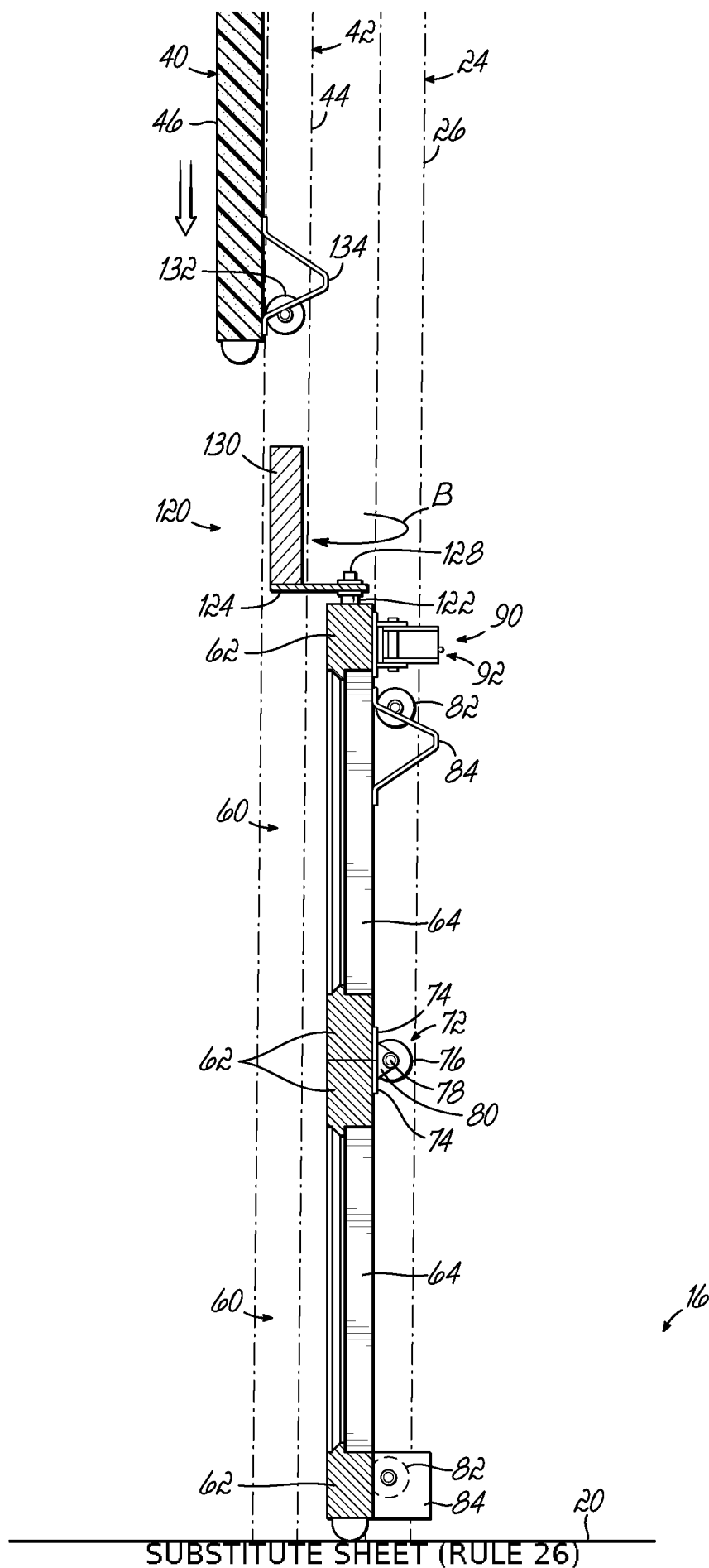


FIG. 7

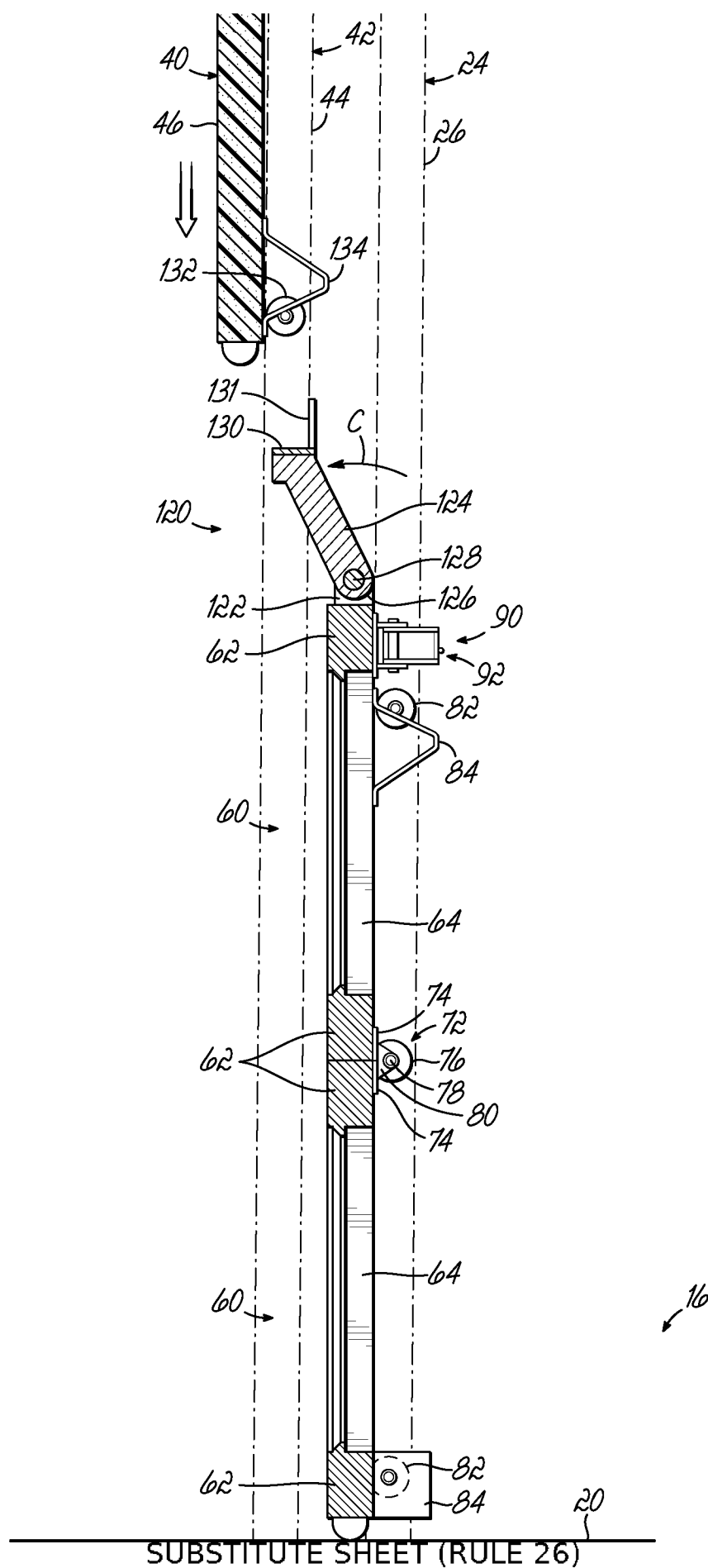


FIG. 8

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2019/057306

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - B65G 69/28; B65G 69/32; E06B 9/08 (2019.01)

CPC - B65G 69/2876; B65G 69/28; B65G 69/287 (2019.08)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

See Search History document

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

USPC - 52/173.2; 52/745.05; 160/29 (keyword delimited)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

See Search History document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5,408,789 A (PLFEGGER) 25 April 1995 (25.04.1995) entire document	1-24
A	US 5,564,238 A (ELLIS) 15 October 1996 (15.10.1996) entire document	1-24
A	US 2006/0124252 A1 (MILLER et al) 15 June 2006 (15.06.2006) entire document	1-24
A	US 2013/0291455 A1 (WIEGEL et al) 07 November 2013 (07.11.2013) entire document	1-24

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Further documents are listed in the continuation of Box C.

☐

See patent family annex.

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Date of the actual completion of the international search

26 November 2019

Date of mailing of the international search report

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