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SHIPPING CONTAINER THEFT PREVENTION DEVICE

Abstract

A theft prevention device for a shipping container includes a channel and a plurality of magnets. The channel is defined by a base plate, a first plate, and a second plate. The base plate has a first side and a second side. The first plate extends from a first edge of the base plate in a longitudinal direction away from and perpendicular to the first side of the base plate. The second plate extends from a second edge of the base plate opposite the first edge of the base plate in the longitudinal direction away from and perpendicular to the first side of the base plate. The first plate extends away from the base plate farther than the second plate. The plurality of magnets is coupled to the first plate on a channel side of the first plate.

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Background/Summary

CROSS-REFERENCE TO RELATED APPLICATIONS [0001] This application claims priority to and benefit of U.S. Provisional Application No. 63/551,442, filed on Feb. 8, 2024, which is incorporated herein by reference in its entirety.

TECHNICAL FIELD

[0002] The present invention relates to a device for preventing theft from shipping containers. More specifically the present invention relates to a device that utilizes magnetic force and the weight of a shipping container to prevent the doors of the shipping container from opening.

BACKGROUND

[0003] The global transportation of goods via cargo containers represents a critical component of modern commerce. However, the prevalence of cargo theft poses significant challenges to supply chain security and economic stability. Theft from shipping containers has long been a serious issue, but this theft has increased over the last few years. Bands of thieves have been known to board moving trains to pry open the doors of shipping containers. Once a door has been pried open, a thief can unload the contents quickly, especially if the contents are of a size and weight that an individual can easily move. High value portable items, such as electronic gaming consoles and high-end shoes, are especially vulnerable to such theft. The yearly loss from shipping container theft has been estimated to be about $500 million.

[0004] Conventional locks require a key or a combination which can be problematic for an international shipping container because the key or the combination has to travel with the shipping container. Moreover, conventional locks can be easily cut, disabled, or broken so that they do not actually deter theft and are essentially useless for a shipping container. The doors of a shipping container often have a seal across them so that a broken seal is indicative of the door having been opened. However, the broken seal does not provide any theft prevention.

SUMMARY

[0005] According to certain aspects of the present disclosure, a theft prevention device for a shipping container includes a channel and a plurality of magnets. The channel is defined by a base plate, a first plate, and a second plate. The base plate has a first side and a second side. The first plate extends from a first edge of the base plate in a longitudinal direction away from and perpendicular to the first side of the base plate. The second plate extends from a second edge of the base plate opposite the first edge of the base plate in the longitudinal direction away from and perpendicular to the first side of the base plate. The first plate extends away from the base plate farther than the second plate. The plurality of magnets is coupled to the first plate on a channel side of the first plate.

[0006] According to certain aspects of the present disclosure, a theft prevention device for a shipping container includes a channel, a plurality of magnets, an angle bracket, a threaded member, and an internally threaded sleeve. The channel is defined by a base plate, a first plate, and a second plate. The base plate has a first side and a second side. The first plate extends from a first edge of the base plate in a longitudinal direction away from and perpendicular to the first side of the base plate. The second plate extends from a second edge of the base plate opposite the first edge of the base plate in the longitudinal direction away from and perpendicular to the first side of the base

plate. The first plate extends away from the base plate farther than the second plate. The plurality of magnets is coupled to the first plate on a channel side of the first plate. The angle bracket has two perpendicular bracket plates connected along a seam. One of the bracket plates has an elongate slot disposed therethrough, the elongate slot having a long dimension oriented transverse to the seam. The threaded member extends from a side of the first plate opposite the channel. The threaded member is disposed through the elongate slot of the angle bracket. The internally threaded sleeve is disposed around the threaded member. The internally threaded sleeve is configured to be tightened against the angle bracket to secure the angle bracket against the first plate so that the other of the bracket plates extends parallel to the base plate.

[0007] According to certain aspects of the present disclosure, a theft prevention device for a shipping container includes a channel, a plurality of magnets, a hook extension, an angle bracket, a threaded member, and an internally threaded sleeve. The channel is defined by a base plate, a first plate, and a second plate. The base plate has a first side and a second side. The first plate extends from a first edge of the base plate in a longitudinal direction away from and perpendicular to the first side of the base plate. The second plate extends from a second edge of the base plate opposite the first edge of the base plate in the longitudinal direction away from and perpendicular to the first side of the base plate. The first plate extends away from the base plate farther than the second plate. The plurality of magnets is coupled to the first plate on a channel side of the first plate. The hook extension is disposed at an end of the first plate opposite from the base plate. The hook extension includes a third plate extending transversely beyond the first plate and oriented at an angle toward the second plate, a fourth plate extending perpendicular to an end of the third plate and away from the second plate, and a fifth plate extending perpendicular to an end of the fourth plate. The angle bracket has two perpendicular bracket plates connected along a seam. One of the bracket plates has an elongate slot disposed therethrough, the elongate slot having a long dimension oriented transverse to the seam. The threaded member extends from a side of the first plate opposite the channel. The threaded member is disposed through the elongate slot of the angle bracket. The internally threaded sleeve is disposed around the threaded member. The internally threaded sleeve is configured to be tightened against the angle bracket to secure the angle bracket against the first plate so that the other of the bracket plates extends parallel to the base plate.

[0008] Embodiments of the invention advantageously mitigate risks associated with cargo theft, safeguard valuable assets, and enhance the security of global supply chains.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] For a more complete understanding, reference is now made to the following description taken in conjunction with the accompanying drawings in which:

[0010] FIG. **1** shows a schematic drawing of a door end of an exemplary shipping container;

[0011] FIG. **2** shows a schematic drawing of a bottom side of the door end of the exemplary shipping container shown in FIG. **1**;

[0012] FIG. **3** shows a schematic three dimensional view of an exemplary theft prevention device according to an embodiment;

[0013] FIG. **4** shows a schematic top plan view of the theft prevention device shown in FIG. **3**, according to an embodiment;

[0014] FIG. **5** shows a schematic front elevation view of the theft prevention device shown in FIG. **3**, according to an embodiment;

[0015] FIG. **6**A shows a schematic right side view of the theft prevention device of FIG. **3**, shown in a first configuration, according to an embodiment;

[0016] FIG. **6**B shows a schematic right side view of the theft prevention device of FIG. **3**, shown

in a second configuration, according to an embodiment;
[0017] FIG. **7** shows an exemplary magnet according to an embodiment; and
[0018] FIG. **8** shows two exemplary theft prevention devices installed on a shipping container according to an embodiment.

DETAILED DESCRIPTION

[0019] Shipping containers, which are also commonly called intermodal containers for carrying goods by rail or on ships have a rectangular box configuration that typically includes a width of about 8 feet and a height of about 8.5 feet, and may have one of a variety of lengths. Most common shipping container lengths include about 20 feet, 40 feet, and 53 feet; however, shipping containers can come in lengths of 8 feet, 45 feet, 48 feet or other lengths. Some shipping containers, for example those commonly known as high cube (or hi-cube) have a height of about 9.5 feet. A typical 20 foot long empty container weighs about 5,000 pounds and a typical 40 foot long empty container weighs over about 8,000 pounds. When fully loaded, a 40 foot long shipping container can weigh as much as 50,000 pounds or more. The embodiments of a theft prevention device as disclosed herein are designed to work with any and all sizes and configurations of shipping containers, and may have slight variations in one dimension or other to accommodate variations in the various shipping containers.
[0020] Regardless of size, an exemplary shipping container **10** having two doors on an end generally has a door configuration as schematically shown in FIG. **1**. For example, a first door **12**A opens toward the reader to the left on hinges **14**A, and a second door **12**B opens toward the reader to the right on hinges **14**B. The doors **12**A and **12**B are typically held shut by clamping bars **16** having knuckles **18** on the ends that engage with hooks **22**. A clamping handle **20** is attached to each clamping bar **16** allowing the clamping bar **16** to be rotated so that each knuckle **18** will engage or disengage with a corresponding hook **22**. A latch **24** is commonly disposed over each clamping handle **20** to help prevent the clamping handle **20** from inadvertently rotating away from the door **12**A, **12**B.
[0021] In some shipping containers **10** there are three clamping bars **16**, but others can have one or two on each door **12**A, **12**B. The doors **12**A and **12**B on some shipping containers may additionally have an order of opening, for example the door **12**B may be configured to open before the door **12**A, where such ordering is the result of an extension or stop member **26** disposed on a free end of door **12**B that extends to cover the free end of door **12**A to prevent it from opening unless door **12**B has already been opened.
[0022] Referring now to FIGS. **1** and **2**, the exemplary shipping container **10** shown in FIG. **1** is shown from a bottom side so that the end having the doors **12**A, **12**B is seen from below. A cross support rail or door sill **28** is a structural member that is disposed just below the doors **12**A, **12**B. The cross support rail **28** has a height, H, and a width, W, which are typically standardly sized for the size of shipping container **10**. As is more fully explained hereinbelow, the theft prevention device disclosed herein is designed to fit over and accommodate the cross support rail **28** of any size shipping container **10**.
[0023] Referring back to FIG. **1**, some shipping containers **10** are constructed such that a bottom side **165** of the cross support rail **28** is flush with bottom side **167** of each of the corner support blocks **168** as shown at the bottom left side of FIG. **1**. In this geometry, the bottom side **165** of the cross support rail **28** is in contact with a surface on which the shipping container rests. In other shipping containers the bottom side **165** of the cross support rail **28** is somewhat elevated relative to the bottom side **167** of each of the corner support blocks **168**, for example as shown by the gap G at the bottom right side of FIG. **1**. In this geometry, the bottom side **165** of the cross support rail **28** is not in contact with the surface on which the shipping container rests, and in fact is a distance G above the surface. The distance G can therefore be about zero (in contact with the ground) or a finite distance from the surface. For example without limitation, depending on the size and type of shipping container, the distance G can be any distance from about a half an inch to about four

inches.
[0024] Embodiments of the invention are directed to a locking mechanism or theft prevention device that can be applied to any size of shipping container having any geometry. Once installed, the locking mechanism or theft prevention device prevents at least one door of the shipping container from being opened. Embodiments of the theft prevention device are physically robust and resistant to cutting, drilling, or other destructive application of force, yet relatively lightweight and easy to install. Embodiments of the invention have a simple design, can be held in position once installed and are easy to manufacture.
[0025] Referring generally to FIGS. **3**-**6**B, in an embodiment a theft prevention device **100** comprises a channel **104**. The channel **104** is defined by a base plate **105**, a first plate **120**, and a second plate **130**. The base plate **105** has a first side **110** and a second side **115**. In an embodiment the first plate **120** extends from a first edge **125** of the base plate **105** in a longitudinal direction **127** away from and perpendicular to the first side **110** of the base plate **105**. In another embodiment the first plate **110** has the same orientation but extends from the first side **110** of the base plate **105** near the first edge **125**. In an embodiment the second plate **130** extends from a second edge **126** of the base plate **105** opposite the first edge **125** of the base plate **105** in the longitudinal direction **127** away from and perpendicular to the first side **110** of the base plate **105**. In another embodiment the second plate **130** has the same orientation but extends from the first side **110** of the base plate **105** near the second edge **126**. The first plate **120** extends away from the base plate **105** farther than the second plate **130**.
[0026] In an embodiment, a plurality of magnets **145** are coupled to the first plate **120** on a channel side **122** of the first plate **120**. In an embodiment, each magnet **145**, for example as shown in FIG. **6**, is disposed within a recess **140** in a channel side **122** of the first plate **120**. Once disposed within the recesses **140** in the front plate **120**, each magnet **145** is effectively permanently held in place by the magnetic force of attraction between each magnet **145** and the steel material of the front plate **120**. In another embodiment, each magnet **145** is disposed on a surface of the channel side **122** of the front plate **120**. In another embodiment the plurality of magnets **145** are additionally adhered to, bonded to, welded to, or otherwise affixed into the plurality of recesses **140** as is known in the art.
[0027] In another embodiment, there may be only a single magnet **145** affixed into the recess **140**. Although three magnets **145** are illustrated in the FIGS., in other embodiments, the number of magnets **145** can be one, two, four, five, six, seven, eight, or more magnets **145**. Further, although the plurality of magnets **145** are illustrated to be circular in plan view, any shape of magnet **145** can be used, including square, rectangular, oval, pentagonal, hexagonal, octagonal, or the like. In one embodiment, each magnet has a pull force of about 130 to 150 pounds. It will be appreciated that the pull force of each magnet **145** may be less than or greater than 130 pounds or greater than **150** pounds. Further, it has been observed that a number of magnets **145** applied together results in a total pull force that can be slightly less than the pull force of a single magnet **145** times the number of magnets. In an embodiment, the one or more magnets **145** is a neodymium magnet but other materials may be used for the one or more magnets **145**.
[0028] In the illustrated embodiments, the theft prevention device **100** has a distance between the first plate **120** and the second plate **130** that accommodates the width, W, of the cross support rail **28** shown in FIG. **2**. Further the first plate **120** has a height in the longitudinal direction **127** extending away from the base plate **105**, to accommodate the height, H, of the cross support rail **28** and further extend to cover a portion **170** of at least one of the two doors **12**A, **12**B (see FIGS. **1** and **8**). As noted above, based at least in part on the type of shipping container being used, the bottom side **165** of the cross support rail **28** can be somewhat elevated relative to the bottom side **167** of each of the corner support blocks **168**, for example as shown by the gap G at the bottom right side of FIG. **1**. In this geometry, the bottom side **165** of the cross support rail **28** is not in contact with the surface on which the shipping container rests, and in fact is a distance G above the surface.

[0029] To account for a non-zero gap dimension G, the theft prevention device **100** includes an angle bracket **200** as can best be seen in FIGS. **3**, **6**A, and **6**B. The angle bracket **200** is secured at an adjustable position relative to the base member **105** to add a distance to accommodate the gap dimension G. The angle bracket **200** includes a first bracket plate **210** and a second bracket plate **220**. The first and second bracket plates **210**, **220** are perpendicularly connected along a seam **230**. The first bracket plate **210** includes an elongate slot **240** disposed therethrough (see FIGS. **5**-**6**B). The elongate slot **240** has a long dimension oriented transverse to the seam **230**. In an embodiment, the long dimension of the elongate slot **240** is about 2 inches. In other embodiments the long dimension of the elongate slot is any length between about a half an inch to about four inches. As will be noted again below, in an embodiment, the longitudinal height of the second plate **130** in the longitudinal direction **127** is greater than the dimension G.
[0030] As can best be seen in FIGS. **4**, **6**A, and **6**B, a threaded member **250** extends from a side **260** of the first plate **120** opposite the channel **104**. The threaded member **250** is disposed through the elongate slot **240** of the angle bracket **200**. An internally threaded sleeve **270** is disposed around the threaded member **250**. In an embodiment, the internally threaded sleeve **270** includes an arm **280** extending from an exterior of the sleeve **270** to provide a moment arm for rotating the sleeve **270**. Rotating the internally threaded sleeve **270** moves it along the threaded member **250** to the left or right as viewed in FIG. **6**A or **6**B.
[0031] When the sleeve **270** is rotated so that it is moved to the left in FIG. **6**A or **6**B, the sleeve **270** can be tightened against the angle bracket **200** to secure the angle bracket **200** against the first plate **120** so that the second bracket plate **220** extends parallel to the base plate **105**. In an embodiment, a stainless steel plate **290** is coupled to the side **260** of the first plate **120**. The stainless steel plate **290** is coupled to the first plate **260**, for example without limitation, by welding, bonding, or an adhesive. The stainless steel plate **290** has a width, for example, of about ⅛.sup.th (0.13) inch. The stainless steel plate **290** adds an additional barrier on top of the first plate **120** to protect the first plate **120** from malicious damage caused, for example, by a cutting torch. When the angle bracket **200** is positioned against the first plate **120** as shown in FIG. **6**A, the width of the stainless steel plate **290** also provides a stop against upward motion of the angle bracket **200** (in the longitudinal direction **127**).
[0032] Referring generally to FIGS. **6**A and **6**B, prior to attaching the theft prevention device **100** to a shipping container **10**, the angle bracket **200** can be positionally adjusted relative to the bottom side **115** of the base plate **105** to accommodate the dimension G for the shipping container **10**. For example, referring in particular to FIG. **6**A, for a shipping container **10** having a non-zero dimension G, the angle bracket **200** is adjusted to be extended from a bottom side **115** of the base plate **105**. This exemplary extended position accommodates the gap G between the bottom side **165** of the cross support rail **28** and the surface on which the shipping container **10** rests. Referring in particular to FIG. **6**B, to mount the theft prevention device **100** on a shipping container **10** for which the gap G is zero, the angle bracket can be pre-positioned so that the second plate **220** is in contact with a bottom of the second side **115** of the base plate **105**.
[0033] Once placed under the cross support rail **28**, the height of the second pate **130** and the weight of the shipping container **10** in combination with the attractive force of the plurality of magnets **145** prevents the theft prevention device **100** from being removed. Even if a bad actor were to loosen the sleeve **270** to try to access the angle bracket **200**, the weight of the shipping container **10** pressing down on the angle bracket **200** along with the attractive force of the magnets **145** prevents the theft prevention device **100** from being removed. To accommodate a gap G smaller than the configuration shown in FIG. **6**A, the angle bracket **200** can be secured in a position between those shown in FIGS. **6**A and **6**B, so that part of the first bracket plate **210** is positioned over the stainless steel plate **290** with the second bracket plate **220** spaced from the bottom side **115** of the base plate **105**. In this configuration, even if a bad actor were to loosen the sleeve **270** to try to access the angle bracket **200**, the height of the second plate **130** in the longitudinal direction **127**

along with the attractive force of the magnets **145** prevents the theft prevention device **100** from being removed. Thus, the theft prevention device **100** so installed cannot be removed without lifting the shipping container off the surface on which it rests.

[0034] Referring again generally to FIGS. **3-6**B, in an embodiment, the theft prevention device **100** includes a hook extension **300** disposed at an end of the first plate **120** opposite from the base plate **105**. In an embodiment the hook extension **300** is generally rectangular in a top plan view. The hook extension **300** includes a third plate **310** extending transversely beyond the first plate **120** and oriented at an angle **320** toward the second plate **130**. In an embodiment, the third plate **310** extends transversely beyond the first plate **120** and is oriented toward the second plate **130** at the angle **320** of about 14 degrees relative to a plane of the first plate **120**. In other embodiments the angle **320** is other than 14 degrees, for example, in a range between about 10 and 20 degrees, or 5 and 25 degrees.

[0035] A fourth plate **330** extends perpendicular to an end of the third plate **310** and away from the second plate **130**. A fifth plate **340** extends perpendicular to an end of the fourth plate **330** to complete the hook extension **300**. In an embodiment, the hook extension **300** is sized to accommodate a clamping bar **16** of the shipping container **10**. Referring to FIGS. **5-6**B, in an embodiment, the first plate **120** further includes a handle **350** disposed on the side of the first plate opposite the channel. In an embodiment a stainless steel plate **315** is coupled to the third plate **310**. The stainless steel plate **315** is coupled to the third plate **310**, for example without limitation, by welding, bonding, or an adhesive. The stainless steel plate **315** has a width, for example, of about ⅛.sup.th (0.13) inch. The stainless steel plate **315** adds an additional barrier on top of the third plate **310** to protect the third plate **310** from malicious damage caused, for example, by a cutting torch.

[0036] In an embodiment the base plate **105**, the first plate **120**, the second plate **130**, the angle bracket **200**, and the hook extension **300** are made from carbon steel. In an embodiment, at least the first plate **120** is made from a type of steel commonly known as AR500 that is highly resistant to impact, cutting, and abrasion. In an embodiment at least the first plate, the base plate **105**, and the second plate **130** are made of AR500. In another embodiment, the base plate **105**, the first plate **120**, the second plate **130**, the angle bracket **200**, and the hook extension **300** are made of AR500. In an embodiment, at least the first plate **120** is made from a type of steel commonly known as A37 that is also resistant to impact, cutting, and abrasion. In an embodiment at least the first plate, the base plate **105**, and the second plate **130** are made of A37. In another embodiment, the base plate **105**, the first plate **120**, the second plate **130**, the angle bracket **200**, and the hook extension **300** are made of A37. It will be appreciated that the base plate **105**, the first plate **120**, the second plate **130**, the angle bracket **200**, and the hook extension **300** can be made of other materials that provide robustness while also being lightweight.

[0037] In an embodiment, the base plate **105**, the second plate **130**, first bracket plate **210**, the second bracket plate **220**, the third plate **320**, the fourth plate **330**, and the fifth plate **350** are each about a quarter (0.25) inch thick, and the first plate **120** is about ⅝ (0.63) inch thick. The front plate **120** is about 19.25 inches high and about 4 inches wide, where high means the dimension in the longitudinal direction **127** that the front plate **120** extends away from the base plate **105**. However, in other embodiments as may be required or desired to accommodate other shipping containers or in embodiments using different or varied materials the thicknesses of all the plates notes above can be other than the thicknesses noted here, and the height of the first plate **120** can be other than about 19.25 inches.

[0038] In an embodiment the base plate **105**, the first plate **120**, and the second plate **130** are attached by welding or by another attachment mechanism as known in the art. In another embodiment the base plate **105** and either the first plate **120** or the second plate **130** are integrally cast or molded from the same material. In another embodiment the base plate **105**, the first plate **120**, and the second plate **130** are all integrally cast or molded from the same material. Regardless of whether the base plate **105**, the first plate **120**, and the second plate **130** are attached components

or a monolithic structure cast or molded from the same material, in an embodiment the first plate **120** extends away from the base plate **105** farther than the second plate **130**.
[0039] In an embodiment the hook extension **300** is attached to the first plate **120** by welding or by another attachment mechanism as known in the art. In another embodiment, the hook extension **300** and the first plate **120** are integrally cast or molded from the same material. In an embodiment, the third plate **310**, the fourth plate **330**, and the fifth plate are attached by welding or by another attachment mechanism as known in the art. In another embodiment the third plate **310**, the fourth plate **330**, and the fifth plate are integrally cast or molded from the same material.
[0040] In an embodiment, the first and second bracket plates **210**, **220** are separate plates that are welded or otherwise joined together along the seam **230**. In an embodiment, the angle bracket **200** is a monolithic structure that is bent along the seam **230** into a bracket shape.
[0041] In an embodiment, the theft prevention device **100** weighs about 20 pounds. In other embodiment, the theft prevention device **100** can weigh more or less than about 20 pounds. In some cases, a shipping container may have rust on the cross support rail **28**, which may require an operator/technician to grind the rust off a portion of the cross support rail **28** before applying the theft prevention device **100**.
[0042] In use, whether the gap G is zero or non-zero, installation of the theft prevention device **100** involves lifting the shipping container **10** so that a bottom side **165** of the cross support rail **28** at the door end of the container **10** is exposed. For example, a shipping container **10** having a gap G=0 means that the bottom side **165** of the cross support rail **28** is in contact with the surface on which the shipping container **10** rests. When such a shipping container **10** is thus disposed on the ground or on a surface or stacked on top of other shipping containers **10**, the bottom side **165** is not accessible. To get access to the bottom side **165** the shipping container needs to be lifted. Lifting the shipping container **165** can be achieved by any method as is known in the art, including via a forklift, a crane, or the like.
[0043] Referring to FIG. **8**, with the shipping container **10** lifted to expose the bottom side of the cross support rail **28**, the theft prevention device **100** is positioned so that the hook extension **300** hooks around a clamping bar **16** by going under the clamping bar **16** on a first side and hooking back over the clamping bar **16** on a second side. With the hook extension **300** positioned around the clamping bar **16**, the theft prevention device **100** is positioned so that the channel **104** is below the cross support rail **28**. Still guided by the hook extension **300** on the clamping bar **16**, the theft prevention device **100** is moved upwardly so that the second plate **130** is behind the cross support rail **28** and the cross support rail **28** is seated in the channel **104**. The plurality of magnets **145** secure the theft prevention device **100** to the cross support rail **28** while the shipping container **10** is lifted.
[0044] The theft prevention device **100** on the right in FIG. **8** in particular shows attachment to a shipping container **10** having a zero gap (G=0). In this circumstance the angle bracket **200** has been adjusted to be in contact with the base plate **105** before installing the theft prevention device **100**. Upon placement of the shipping container **10** on a surface or another shipping container, the theft prevention device **100** (on the right in FIG. **8**) is trapped under the cross support rail **28** by the weight of the shipping container **10**. The door **12**B is thus blocked from opening. For doors **12**A, **12**B that are sequentially opened with door **12**B opening before **12**A, this positioning of the theft prevention device **100** is sufficient to block both doors **12**A and **12**B. However, if it is desired to block door **12**A in addition to or instead of **12**B, or if the door opening sequence opens **12**A first, the theft prevention device **100** can be also or alternatively installed on the door **12**A as shown on the left in FIG. **8**.
[0045] Regardless of which side or which door **12**A or **12**B is directly blocked by the theft prevention device **100**, the plurality of magnets **145** contacts a front side of the cross support rail **28** with the first plate **120** disposed over the portion **170** of the corresponding door **12**A or **12**B. Contact of the plurality of magnets **145** to the cross support rail **28** magnetically attaches the theft

prevention device **100** to the shipping container **10**. Once the theft prevention device **100** is so attached, the shipping container is lowered onto the ground, a support surface, or another shipping container, so that the weight of the shipping container **10** rests on the base plate **105** and prevents the theft prevention device **100** from being removed.
[0046] The theft prevention device **100** on the left in FIG. **8** in particular shows attachment to a shipping container **10** having a finite gap G. In this circumstance the angle bracket **200** has been adjusted to accommodate the space between the bottom side **165** of the cross support rail **28** and the surface on which the shipping container **10** rests before installing the theft prevention device **100**. Upon placement of the shipping container **10** on a surface or another shipping container, the theft prevention device **100** (on the left in FIG. **8**), adjusted for the gap G, is trapped under the cross support rail **28** by the weight of the shipping container **10**. The door **12**A is thus blocked from opening. For doors **12**A, **12**B that are sequentially opened with door **12**A opening before **12**B, this positioning of the theft prevention device **100** is sufficient to block both doors **12**A and **12**B. However, if it is desired to block door **12**B in addition to or instead of **12**A, or if the door opening sequence opens **12**B first, the theft prevention device **100** can be also or alternatively installed on the door **12**B as shown on the right in FIG. **8**.
[0047] Regardless of which side or which door **12**A or **12**B is directly blocked by the theft prevention device **100**, the plurality of magnets **145** again contacts a front side of the cross support rail **28** with the first plate **120** disposed over the portion **170** of the corresponding door **12**A or **12**B. Contact of the plurality of magnets **145** to the cross support rail **28** magnetically attaches the theft prevention device **100** to the shipping container **10**. Once the theft prevention device **100** is so attached, the shipping container is lowered onto the ground, a support surface, or another shipping container, so that the weight of the shipping container **10** rests on the angle bracket **200** and prevents the theft prevention device **100** from being removed.
[0048] Embodiments of the invention are advantageous because it is simple to install, requiring a minimal application time (e.g., about 15 seconds). The theft prevention device blocks access to one or both of the doors. Selection of the materials used for the theft prevention device (e.g., selecting materials having relatively high hardness and/or other mechanically beneficial properties) can further deter theft by increasing the time necessary to destroy the device. The simple design also avoids the risks and other downsides associated with key or combination-based locks that are logistically challenging and/or easily destroyed.
[0049] It should be understood that the drawings and detailed description herein are to be regarded in an illustrative rather than a restrictive manner, and are not intended to be limiting to the particular forms and examples disclosed. On the contrary, included are any further modifications, changes, rearrangements, substitutions, alternatives, design choices, and embodiments apparent to those of ordinary skill in the art, without departing from the spirit and scope hereof.

Claims

1. A theft prevention device for a shipping container, the device comprising: a channel defined by a base plate having a first side and a second side; a first plate extending from a first edge of the base plate in a longitudinal direction away from and perpendicular to the first side of the base plate; and a second plate extending from a second edge of the base plate opposite the first edge of the base plate in the longitudinal direction away from and perpendicular to the first side of the base plate, the first plate extending away from the base plate farther than the second plate; and a plurality of magnets coupled to the first plate on a channel side of the first plate.
2. The theft prevention device of claim 1, further comprising: an angle bracket having two perpendicular bracket plates connected along a seam, one of the bracket plates having an elongate slot disposed therethrough, the elongate slot having a long dimension oriented transverse to the seam; a threaded member extending from a side of the first plate opposite the channel, the threaded

member disposed through the elongate slot of the angle bracket, and an internally threaded sleeve disposed around the threaded member, the internally threaded sleeve configured to be tightened against the angle bracket to secure the angle bracket against the first plate so that the other of the bracket plates extends parallel to the base plate.

3. The theft prevention device of claim 2, wherein the internally threaded sleeve includes an arm extending from an exterior of the sleeve to provide a moment arm for rotating the sleeve.

4. The theft prevention device of claim 2, wherein the long dimension of the elongate slot is about 2 inches.

5. The theft prevention device of claim 1, further comprising: a hook extension disposed at an end of the first plate opposite from the base plate, the hook extension including a third plate extending transversely beyond the first plate and oriented at an angle toward the second plate, a fourth plate extending perpendicular to an end of the third plate and away from the second plate, and a fifth plate extending perpendicular to an end of the fourth plate.

6. The theft prevention device of claim 5, wherein the hook extension is sized to accommodate a clamping bar of the shipping container.

7. The theft prevention device of claim 5, wherein the third plate extends transversely beyond the first plate and is oriented toward the second plate at an angle of about 14 degrees relative to a plane of the first plate.

8. The theft prevention device of claim 1, wherein the first plate further comprises a handle disposed on the side of the first plate opposite the channel.

9. The theft prevention device of claim 1, wherein at least the first plate is made from AR500 steel.

10. The theft prevention device of claim 1, wherein at least one of the plurality of magnets is a neodymium magnet.

11. A theft prevention device for a shipping container, the device comprising: a channel defined by a base plate having a first side and a second side; a first plate extending from a first edge of the base plate in a longitudinal direction away from and perpendicular to the first side of the base plate; and a second plate extending from a second edge of the base plate opposite the first edge of the base plate in the longitudinal direction away from and perpendicular to the first side of the base plate, the first plate extending away from the base plate farther than the second plate; and a plurality of magnets coupled to the first plate on a channel side of the first plate; an angle bracket having two perpendicular bracket plates connected along a seam, one of the bracket plates having an elongate slot disposed therethrough, the elongate slot having a long dimension oriented transverse to the seam; a threaded member extending from a side of the first plate opposite the channel, the threaded member disposed through the elongate slot of the angle bracket, and an internally threaded sleeve disposed around the threaded member, the internally threaded sleeve configured to be tightened against the angle bracket to secure the angle bracket against the first plate so that the other of the bracket plates extends parallel to the base plate.

12. The theft prevention device of claim 11, wherein the internally threaded sleeve includes an arm extending from an exterior of the sleeve to provide a moment arm for rotating the sleeve.

13. The theft prevention device of claim 11, wherein the long dimension of the elongate slot is about 2 inches.

14. The theft prevention device of claim 11, further comprising: a hook extension disposed at an end of the first plate opposite from the base plate, the hook extension including a third plate extending transversely beyond the first plate and oriented at an angle toward the second plate, a fourth plate extending perpendicular to an end of the third plate and away from the second plate, and a fifth plate extending perpendicular to an end of the fourth plate.

15. The theft prevention device of claim 14, wherein the hook extension is sized to accommodate a clamping bar of the shipping container.

16. The theft prevention device of claim 14, wherein the third plate extends transversely beyond the first plate and is oriented toward the second plate at an angle of about 14 degrees relative to a plane

of the first plate.

17. A theft prevention device for a shipping container, the device comprising: a channel defined by a base plate having a first side and a second side; a first plate extending from a first edge of the base plate in a longitudinal direction away from and perpendicular to the first side of the base plate; and a second plate extending from a second edge of the base plate opposite the first edge of the base plate in the longitudinal direction away from and perpendicular to the first side of the base plate, the first plate extending away from the base plate farther than the second plate; and a plurality of magnets coupled to the first plate on a channel side of the first plate; a hook extension disposed at an end of the first plate opposite from the base plate, the hook extension including a third plate extending transversely beyond the first plate and oriented at an angle toward the second plate, a fourth plate extending perpendicular to an end of the third plate and away from the second plate, and a fifth plate extending perpendicular to an end of the fourth plate; an angle bracket having two perpendicular bracket plates connected along a seam, one of the bracket plates having an elongate slot disposed therethrough, the elongate slot having a long dimension oriented transverse to the seam; a threaded member extending from a side of the first plate opposite the channel, the threaded member disposed through the elongate slot of the angle bracket, and an internally threaded sleeve disposed around the threaded member, the internally threaded sleeve configured to be tightened against the angle bracket to secure the angle bracket against the first plate so that the other of the bracket plates extends parallel to the base plate.

18. The theft prevention device of claim 17, wherein the internally threaded sleeve includes an arm extending from an exterior of the sleeve to provide a moment arm for rotating the sleeve, and the long dimension of the elongate slot is about 2 inches.

19. The theft prevention device of claim 17, wherein the hook extension is sized to accommodate a clamping bar of the shipping container, and wherein the third plate extends transversely beyond the first plate and is oriented toward the second plate at an angle of about 14 degrees relative to a plane of the first plate.

20. The theft prevention device of claim 17, wherein at least the first plate is made from AR500 steel, and at least one of the plurality of magnets is a neodymium magnet.