Dec. 30, 1952 N. P. THOMSEN 2,623,255

RELEASABLE CHAIN STOPPER

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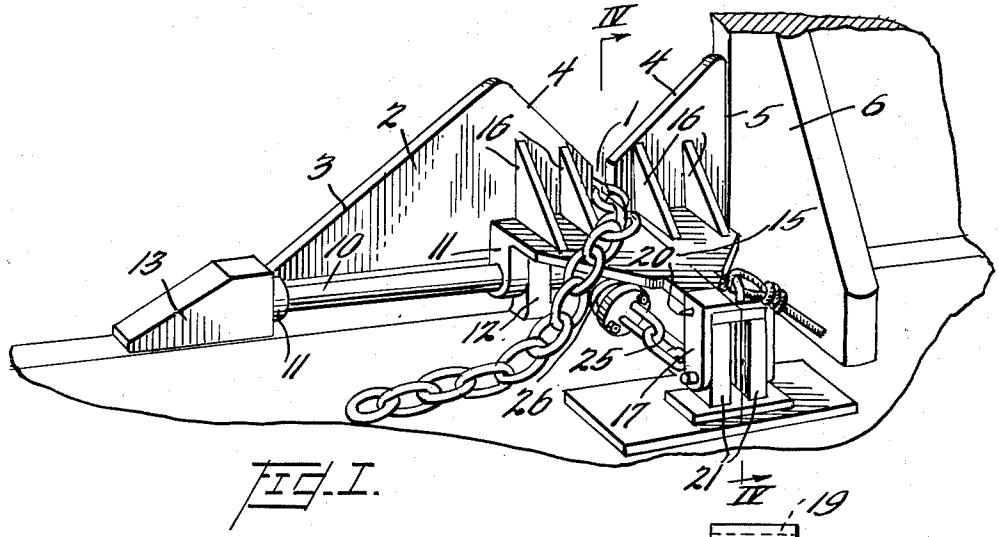


FIG. I.

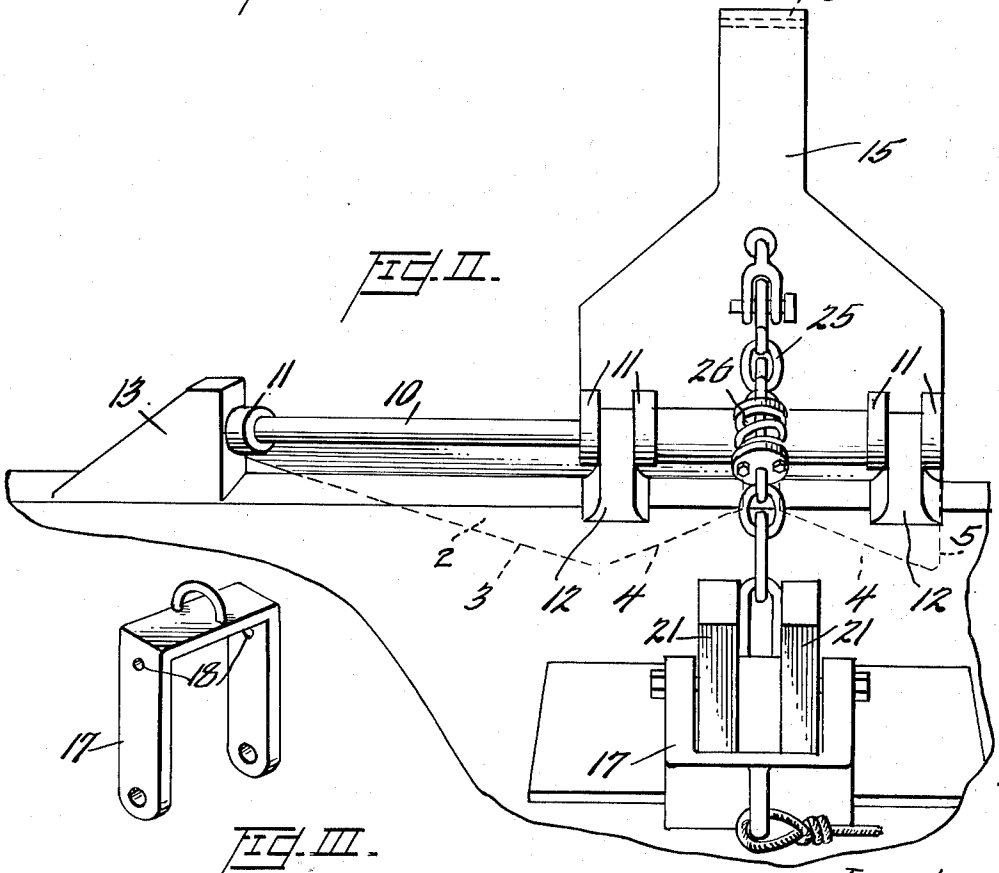


FIG. II.

FIG. III.

Inventor

BY Niels P. Thomsen,

Roy C. Hackleyer

ATTORNEY

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FIG. IV.

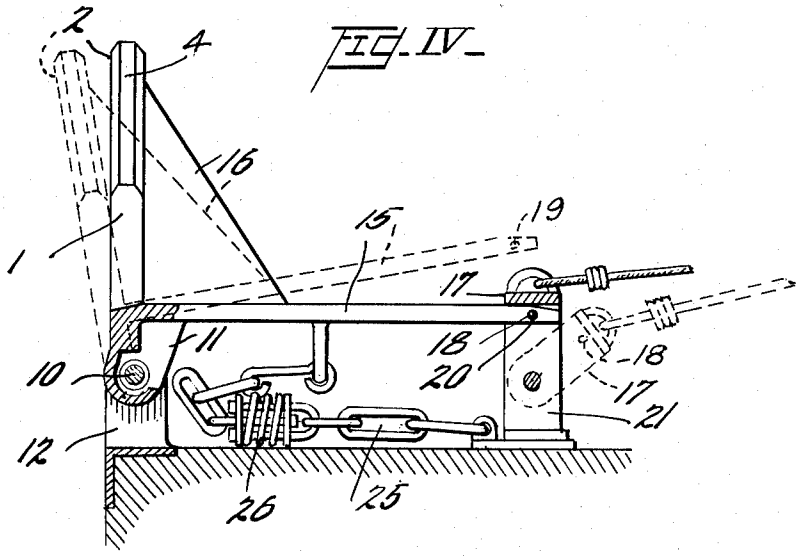
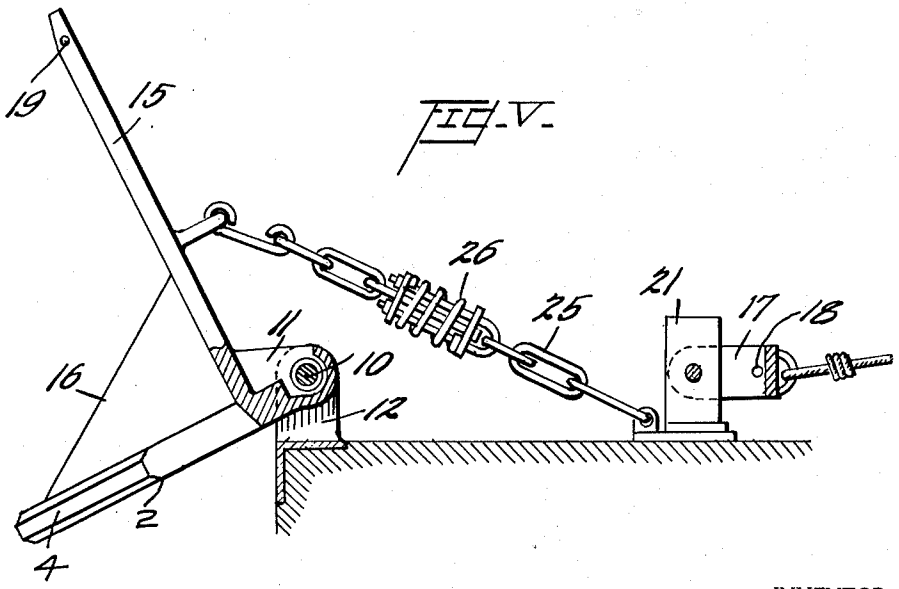


FIG. V.



INVENTOR

Niels P. Thomsen,

BY Roy C. Haubleyfo

ATTORNEY

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FIG. VI.

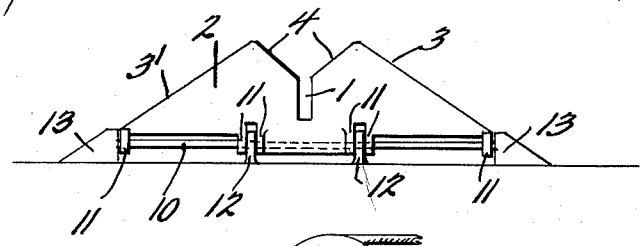


FIG. VII.

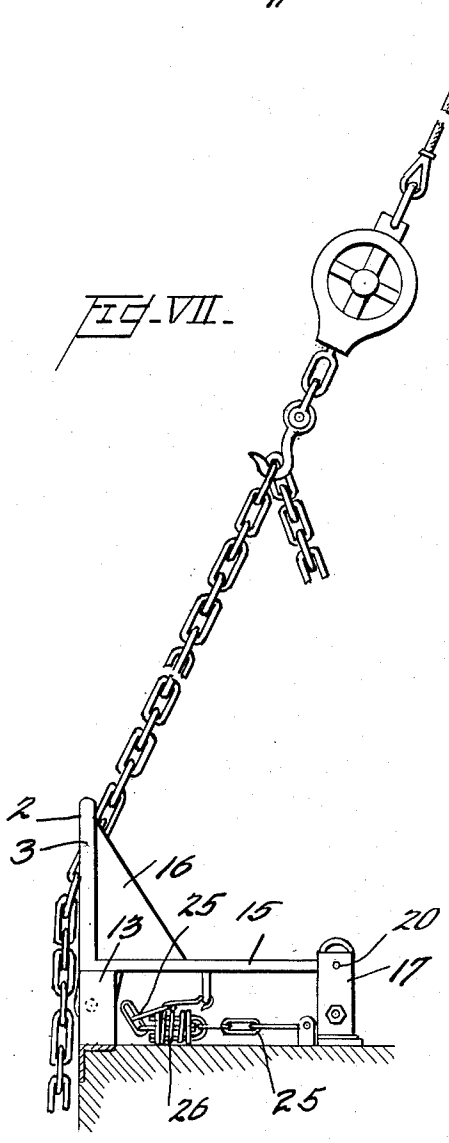


FIG. VIII.

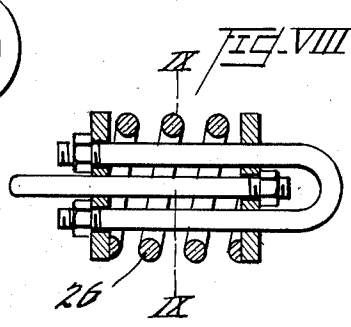


FIG. IX

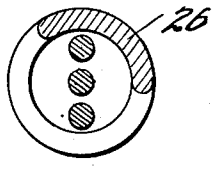
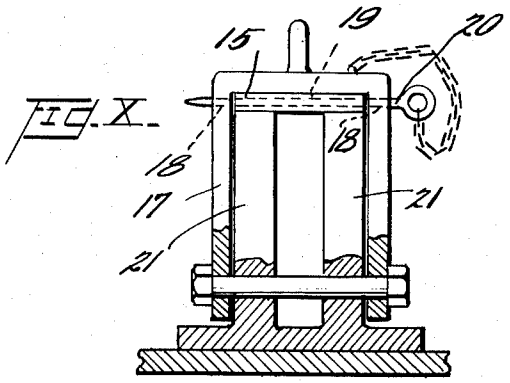


FIG. X.



INVENTOR

Niels P. Thomsen,

BY Roy C. Hachley Jr.

ATTORNEY

Patented Dec. 30, 1952 2,623,255

UNITED STATES PATENT OFFICE

2,623,255

RELEASABLE CHAIN STOPPER

Niels P. Thomsen, Toledo, Ohio

Application September 27, 1950, Serial No. 186,980

1 Claim. (Cl. 24—116)

(Granted under the act of March 3, 1883, as amended April 30, 1923; 370 O. G. 757)

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The invention described herein may be manufactured and used by or for the Government of the United States for governmental purposes without payment to me of any royalty thereon in accordance with the provisions of the act of April 30, 1928 (ch. 460, 45 Stat. 467).

This invention relates to devices for the handling of heavy chain, and more particularly to a chain stopper.

There are many activities in marine operations wherein heavy chain, often under strain, must be handled in a variety of ways. For example, buoy tenders must handle heavy buoy chain loaded by its own weight and often by the weight of the buoy sinker or anchor. At present, this is done with pelican hooks, block and tackle, manila lines, winches, and booms with which chain, often still dragging in the water so as to constitute a dynamic and live load, is hoisted over the deck of the ship. Chain and rope under heavy load are stretched across and over the deck where men must work. When there is a failure in a hook, block, hoisting line, or vang line, or when the power driving a winch or boom fails, or when any one of a number of other incidents which cannot always be prevented occurs, all the personnel working in the area are subjected to the dangers of a whipping heavy chain and objects falling from the boom. These hazards have necessitated that heavy chain under load be handled in a slow, cautious manner inconsistent with rapid work.

It is, therefore, an object of this invention to provide a device which will enable men to handle heavy chain more rapidly and efficiently.

It is a further object of this invention to provide a device, the use of which will remove the hazards from chain handling.

These objects are accomplished by this invention which comprises a slotted member or plate, the top edge of which forms a series of guide surfaces which direct moving chain into the slot in the slotted member in which chain will catch, along with means for hinging the slotted member to the deck and for holding it in an upright position for catching the chain, and in a downwardly slanting position for releasing the chain.

The invention will be made clear by reference to the following description and accompanying drawing, wherein:

Figure I is a pictorial view showing the back side of an embodiment of the device adapted for mounting on the deck of a ship and adjacent to a bulkhead.

Figure II is a view of the same embodiment taken from above and directly behind the device, showing it in the full open or chain releasing position.

Figure III is a pictorial detail of the hinge lock.

Figure IV is a vertical longitudinal section

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taken approximately on line IV—IV of Figure I, showing the device in closed and partially open positions.

Figure V is a vertical section taken approximately on line IV—IV of Figure I, showing the device in fully open or chain releasing position.

Figure VI is a front elevation of an embodiment of the device adapted for use on an open dock, or for use on a ship deck away from any bulkhead or stanchion.

Figure VII is a side elevation of the device in the closed position, with chain being drawn through the V so that the chain will automatically become secured when it is released.

Figure VIII is a detail of the spring in the stop chain.

Figure IX is section IX—IX of Figure VIII, further illustrating the structure of the spring in the stop chain.

Figure X is a back elevation of the hinge lock.

In the preferred embodiment illustrated, chain is actually stopped in a vertical slot 1, open at the top, which is cut in a stop member or slotted plate 2 (see Figure I). The upper edges of the slotted plate 2 form a series of guide surfaces 3 and 4 such that if a chain hanging over the side of the deck is moved toward the slot 1 it will be directed by the guide surfaces into the slot. The preferred embodiment has guide surfaces 4 extending upward from each side of the slot 1 in the form of a V. A guide surface 3 extends from the top of one side of the V 4 downward toward the deck, preferably at an angle with the deck of the order of 35° or less so that chain will slide easily upward and over it into the V 4. When the device is installed adjacent to a bulkhead or rail, there need be only one guide surface 3, and the opposite side 5 of the slotted plate 2 is vertical to fit adjacent to such bulkhead 6, as shown in Figure I. But when the device is installed on an open edge of a deck or dock, then a similar guide surface 3' is on the other side as shown in Figure VI. The thickness of the slotted plate is somewhat less than the distance between odd chain links.

Suitable means for hingedly fastening the slotted plate to a base such as a deck or dock are provided as shown in Figures I, II, IV, V, and VI. Parallel to the bottom edge of the plate 2, there is a hinge shaft 10 journalled in bearings in lugs 11 which protrude from the slotted plate 2. The hinge shaft 10 is rotatably mounted parallel to the deck of the ship by stationary lugs 12, and triangle blocks 13 which are rigidly secured to the deck. The triangle blocks serve a dual function as a mounting for the end of the hinge shaft and as the lower end of the guide surface 3.

Suitable means are also provided (see Figure VII) for holding the slotted plate 2 in seated position that is roughly vertical and for releasing it to permit rotation to an open position at

which the slotted plate slants downward from its base edge (see Figures IV and V). Protruding from the back of the plate **2** is an arm **15** rigidly secured at one end to the slotted plate **2** by braces **16**. At the free end of the arm **15**, a hinge latch **17** is hinged to the deck so that it may be swung up over the end of the arm **15** to latch it in its seated position as in Figures I and VII, or off of the arm so as to free it as in Figures II, IV, and V. The seated position will normally be with plate **2** near vertical, but any predetermined position relative to the chain or the axis thereof, at which the chain will catch securely, will be satisfactory. Through the hinge latch **17** and through the free end of the arm **15**, holes **18** and **19** are drilled so that a lock pin **20** may be inserted to prevent accidental unlatching of the arm. The holes may be through the hinged latch **17** and the arm rests **21**, if desired.

Suitable means for limiting the angular movement of the slotted plate **2** while the chain is being released are also provided. For example, a stop chain **25** may be secured to the deck and to the bottom of the arm **15** of such length as to stop the rotation of the slotted plate **2** about its base at an open position at which chain will slide out of the slot **1** (see Figures II and V). Preferably there is a tension spring **26** in the stop chain **25** which can absorb the shock of stopping the rotation of the plate **2** and arm **15**, and, more important, will operate to automatically return the arm **15** to its seated position after the chain has been released.

Operation

When a long chain is being hoisted aboard a ship, it is usually hoisted in steps, no step any larger than the distance from the hoisting boom to the deck of the ship. A link of the chain is hooked and hoisted up. Then the chain is secured at the deck while a new link further down is hooked. In the operation of this invention, the chain is hoisted upward over the side of the ship and as it is hoisted is moved laterally toward the slot in the chain stopper. The chain rides over the guide surface **3** until it gets into the V **4**. When the pulling stops, the chain links fall into and are caught by the slot **1**. The stop member is held in its seated position by the hinge latch **17** in cooperation with the arm **15**. When a new link is hooked and is hoisted up as shown in Figure VII, the chain comes out of the slot and moves upward, sliding through the V **4**. If the hoisting power fails, the chain stopper catches the chain promptly so that the chain is not lost over the side of the ship and so that there is no danger to personnel. It is to be observed that the chain is secured at the very edge of the deck—there is no chain or line stretched across the deck which is under load as in all previous systems of handling heavy chain. When it is desired to drop chain over the side, the latch pin **20** may be removed, and the hinged latch may be opened as illustrated in Figure IV by a man standing a safe distance from any moving chain. The chain stopper will rotate to the open position shown in Figures II and V, releasing the chain over the side, and then by the action of the spring **26** in the stop chain **25** will reseat itself in the upright position.

Any one size of the chain stopper can handle a variety of sizes of chain, as from ⅝" to 2" in diameter, and with a U bracket fitted into the slot **1** can handle even smaller sizes. The hinging of the slotted member at its very end makes it impossible for the chain to get caught thereunder. Practical tests of the invention aboard buoy tenders have revealed many other advantages inherent in the device. The buoy deck can be completely cleared of all personnel until the chain is automatically and safely secured at the outside edge of the buoy port. The invention eliminates entirely the use of Manila lines, snatch blocks, and pelican hooks from the buoy deck. In the event of casualty to hoisting gear, the device prevents the loss of chain over the side and its eliminates the dangers of a chain whipping about the deck where men are working. It particularly simplifies the dropping of sinkers, taking the place of teeterboards, slip lines, and pelican hooks. It removes for the greater part, the strain and tension on personnel directly handling or supervising buoy handling operations, by eliminating the probability of sudden and serious injury through circumstances beyond their control—falling objects, failure of hooks, blocks, straps, hoisting lines, and vang lines. By eliminating certain operations, and by releasing personnel from fear of injury, the invention speeds up overall buoy handling from 100 to 200 per cent, and permits buoy handling in unfavorable current and weather conditions without unduly endangering personnel. It substantially reduces the personnel requirements on the average buoy deck, and the device permits the standardization of the work methods employed in chain handling to an extent not previously possible. These advantages already experienced in buoy handling, are inherent in the device and will be experienced in its application to other chain handling activities.

It is clear that various modifications of the invention as described can be made without departure from the spirit or the scope thereof. Therefore, the description herein is to be construed as illustrative only, and is not be construed in any limiting sense.

What is claimed is:

A buoy chain suspending and releasing stopper provided with a slot merging into two outwardly open flaring chain guiding surfaces, a supporting base for said stopper, a hinge pin connecting said base with said stopper the hinge pin being parallel to the plane of the margins of said slot and guiding surfaces, an arm rigidly united with said stopper, latching means for releasably latching said arm for at will holding said stopper in chain suspending position and shock absorbing means for arresting the pivotal movement of said stopper when released.

NIELS P. THOMSEN.

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