June 10, 1924. 1,496,863

H. PENTON

SELF UNLOADING VESSEL

Filed June 28, 1922 2 Sheets-Sheet 1

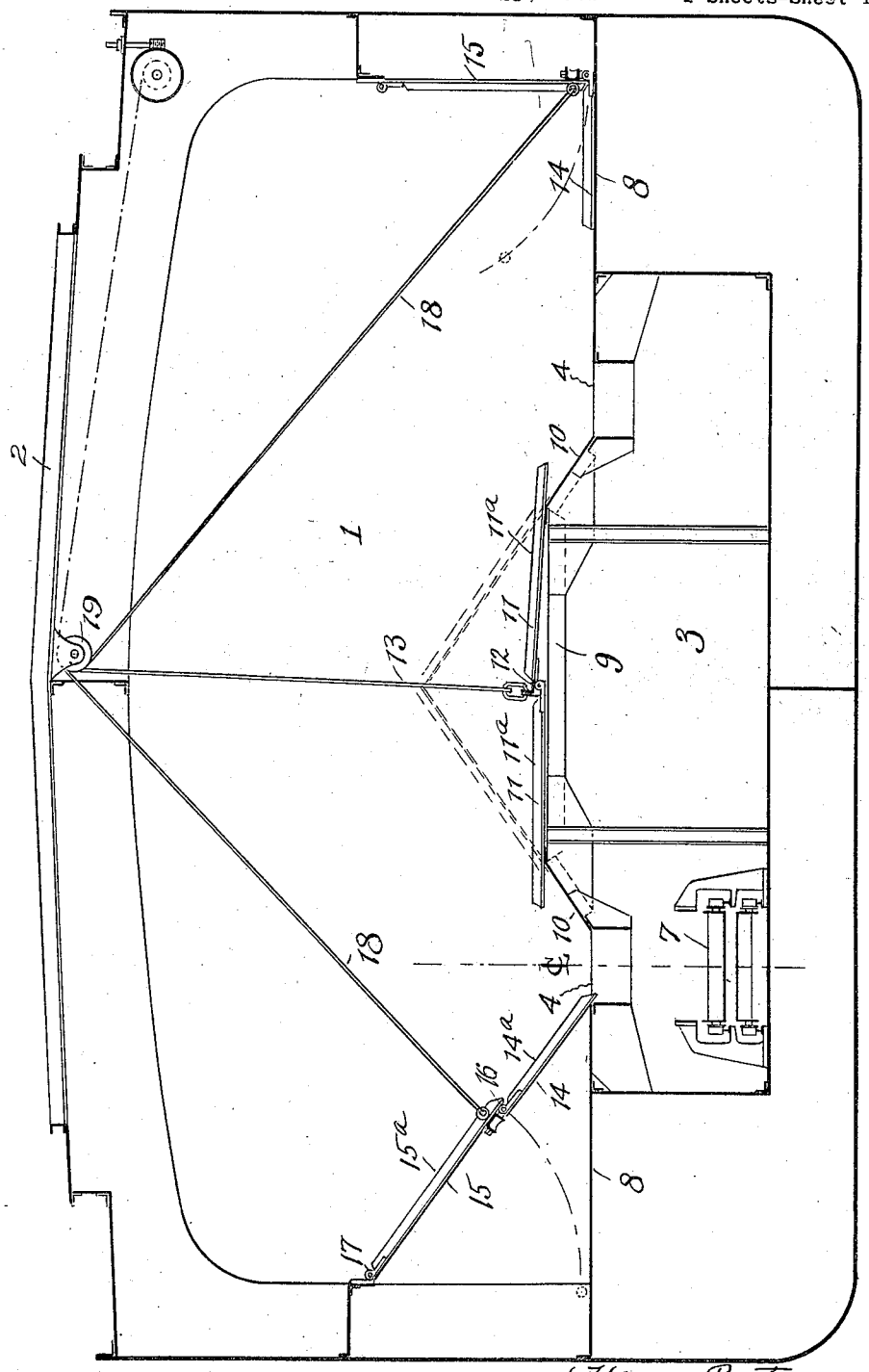


Fig. 1.

Inventors { Henry Penton by Thurston Kerr & Hudson atty's

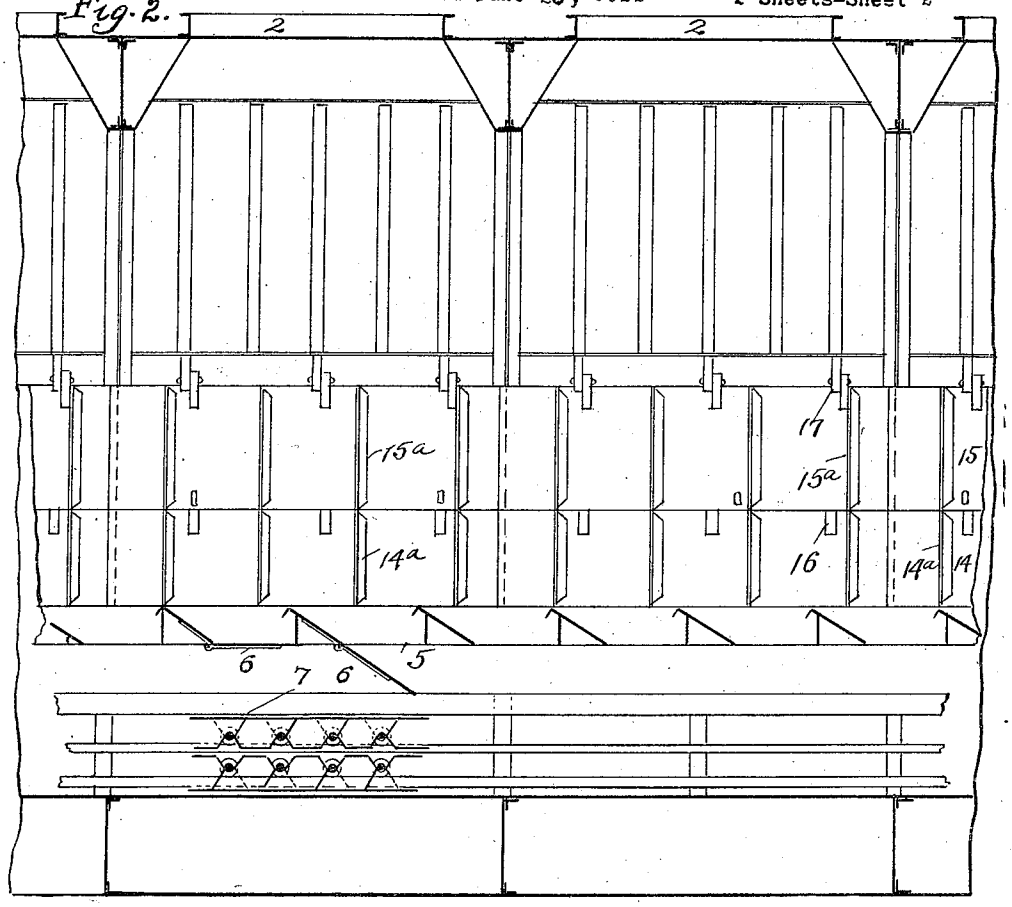
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Fig. 2.



Inventor:
Henry Penton
by
Thurston Kent & Hudson
Attys

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UNITED STATES PATENT OFFICE.

HENRY PENTON, OF LAKEWOOD, OHIO.

SELF-UNLOADING VESSEL.

Application filed June 28, 1922. Serial No. 571,498.

To all whom it may concern:

Be it known that I, HENRY PENTON, a citizen of the United States, residing at Lakewood, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Self-Unloading Vessels, of which the following is a full, clear, and exact description.

This invention relates to construction of vessels of the self unloading conveyor type designed to be loaded with loose material and having a conveyor compartment beneath the hold in which one or more conveyors are mounted for delivering the material to an elevator at one end of the vessel or elsewhere where it is elevated and discharged.

It is the object of the invention to increase the cargo capacity of such vessels and at the same time to increase the stability thereof by lowering the center of gravity of the cargo in the loaded vessel.

The annexed drawing and following description show and describe certain means embodying my invention, the disclosed means, however, constituting but one of the various mechanical forms in which the principle of the invention may be employed.

Reference should be had to the annexed drawing forming a portion of this specification in which Fig. 1 is a horizontal section through the vessel; Fig. 2 is a longitudinal vertical section taken through one of the longitudinal outlets.

In order to provide for free flow of the material in the hold to the outlets leading to the conveyor, it has hitherto been customary to construct the bottom or floor of the hold in hopper form with downwardly inclined fixed slopes leading to the outlet gates. It will be apparent that in such a vessel the space between the hopper slopes and the double bottom is not available for cargo and that the cargo instead of resting upon and being carried by the double bottom, is supported by and upon the hopper slopes and at some distance above the double bottom. From this it follows that the center of gravity is materially higher than would be the case if the cargo rested upon the double bottom as is usual in vessels of the type in which the cargo is discharged through the hatch, and further that a considerable proportion of the interior volume of the vessel is lost as cargo space. It also follows that vessels of certain proportions which would be stable in loaded condition if constructed in the ordinary manner and carrying their cargo directly on the double bottom, are unstable in loaded condition when constructed with a hopper bottom hold, because of the high center of gravity of the cargo and consequent low metacenter, and further that earning and carrying capacity are materially reduced because of the loss of cubic space.

It is the purpose of the present invention to overcome these defects in self-discharging vessels of the conveyor type.

As shown in Figs. 1 and 2 the vessel is provided with a hold 1 provided with the usual hatches 2 and with a conveyor compartment 3 extending longitudinally beneath the hold. One or more longitudinal outlets 4 are provided along the bottom of the hold, the number of such outlets depending upon the size of the vessel and the number of conveyors which it is practicable to provide in the conveyor compartment.

For purposes of illustration I have shown herein two longitudinal outlets 4, each of the outlets consisting of a row of closely spaced openings 5 independently controlled by gates or valves 6. A suitable conveyor 7 extends longitudinally beneath each of the outlets 4. The hold has a substantially horizontal bottom portion 8 between each of the outlets 4 and the side wall of the hold and a substantially horizontal portion 9 between the outlets 4. The horizontal portions 8 and 9 form a substantially flat bottom or floor for the hold. The central floor portion 9 may be elevated slightly above the side floor portions 8 and short inclined portions 10 may be provided adjacent the outlets 4. Auxiliary bottom plates 11 lie upon the central floor portion 9 and extend longitudinally with their outer edges adjacent the outlet 4. The plates 11 may be constructed in sections and provided with transverse stiffening ribs 11^a. The two plates 11 are connected along their inner edges by hinges 12 and a hoist line 13 is connected to the plates 11 at the hinge. When as much of the cargo has been discharged as will flow by gravity to the outlets 4, the plates 11 are tilted by means of the hoist lines 13 to the position shown in dotted lines in Fig. 1 to provide inclined walls forming chutes to direct the material into the outlets 4. Longitudinally extending plates 14 lie upon the bottom portions 8 of the hold upon opposite sides thereof

and these plates may be made up of sections of suitable length as shown in Fig. 2 and provided with transverse stiffening ribs 14ª which may be formed integrally therewith or be in the form of attached angle bars. The inner edges of the plates 14 are spaced outwardly from the outlet openings 4 and the other edges thereof are connected to vertical plates 15 similarly constructed and provided with strengthening ribs 15ª by means of hinges 16. The upper edges of the plate 15 being connected to the side walls of the hold by means of hinges 17. Suitable hoisting means such as cables 18 are attached to the hinged plates 14 and 15 adjacent the hinged connection 16. The cables 18 extend diagonally inward over central pulleys 19 at the top of the hold to suitable winding drums. After the material in the hold will no longer flow by gravity through the discharge outlets, the cables 18 are wound up to tilt the plates 14 and 15 into the position shown at the left in Fig. 1, moving the plates 14 inwardly to a position in which the inner edges of the plates are positioned over the outer edges of the outlets 4 and the plates 14 and 15 form inclined hopper walls down which the material slides into the outlets 4.

Having described my invention, I claim—

1. A self unloading conveyor type vessel having a hold with a substantially flat bottom provided with discharge outlets, shiftable plates at the bottom of the hold suspended from the side walls of the hold and adapted when shifted to form a hopper bottom with walls inclined toward said outlets and extending from the side walls to the outlets to discharge material from the bottom of the hold, means for shifting said plates, and a conveyor compartment beneath said hold into which said material is discharged, said compartment extending longitudinally of the vessel.

2. A self unloading conveyor type vessel having a hold with a substantially flat bottom provided with discharge outlets, a longitudinally extending conveyor compartment beneath said hold, and hinged plates extending along the bottom and sides of said hold and suspended from the side walls of the hold for directing the flow of material to the outlets.

3. A self unloading conveyor type vessel having a hold with a substantially flat bottom extending from one side of the vessel to the other and provided with material discharge outlets, a longitudinally extending conveyor compartment beneath said hold into which the material is discharged through said outlets, and means for shifting the material in the bottom part of the hold to said outlets comprising cooperating tiltable plates adapted to rest against the side and bottom walls, said plates being movable from their vertical and horizontal positions to positions in which they form hopper bottom walls extending from the side walls of the hold to the outlets.

4. A self unloading conveyor type vessel having a hold with a bottom having a longitudinal outlet through which material is to be discharged and a substantially flat horizontal bottom between the outlet and a side wall, a longitudinally extending wall plate hinged along its upper edge to the side wall and adapted to swing inwardly from the wall, a plate extending lengthwise of the hold and lying upon the bottom thereof, and means for tilting said plates to discharge material into said outlet, said plates adapted to be tilted to a position in which they form an inclined bottom wall extending from the outlet to the side wall.

5. A self unloading conveyor type vessel having a hold with a substantially flat bottom provided with a longitudinal material discharge outlet, a conveyor compartment beneath said hold into which material is discharged from said hold, plates pivotally suspended along the sides of the hold and extending to the bottom thereof, plates lying upon the bottom of said hold, and hoisting means connected to said plates to tilt said plates toward said outlet to discharge the material from the bottom portion of the hold into said outlet.

6. A self unloading conveyor type vessel having a hold with a substantially flat bottom provided with spaced longitudinal material discharge outlets, a conveyor compartment beneath said hold into which material is discharged from said hold, plates upon the bottom of the hold between said outlets, the outer edges of said plates lying alongside said outlets and the inner edges of said plates being hinged together and hoisting means connected to said plates along the hinged edges thereof to tilt said plates to discharge material into said outlets.

7. A self unloading conveyor type vessel having a hold with a bottom having a longitudinal outlet through which material is adapted to be discharged and a substantially horizontal bottom between said outlet and a side wall, a plate extending lengthwise of said hold and lying upon said horizontal bottom, the inner edge of said plate being spaced outwardly from said outlet, a substantially vertical longitudinally extending wall plate hinged along its lower edge to the outer edge of said bottom plate and along its upper edge to the side wall of the hold, and hoisting means attached to the plates adapted to tilt said plates inwardly to discharge material into said outlet.

8. A self unloading conveyor type vessel having a hold with a bottom having spaced longitudinal outlets through which material is adapted to be discharged and a substan-

tially horizontal bottom between said outlets and between said openings and side walls, a conveyor compartment beneath said hold into which material is delivered through said outlets, hinged bottom forming plates between said outlets, and hinged bottom and wall plates at the sides of the holds, and hoisting means attached to said plates to tilt the same to discharge material from the bottom of the hold into said outlets.

9. A self unloading conveyor type vessel having a hold with a substantially flat bottom, which has centrally disposed outlets and articulated sections supported from the side walls and adapted to be adjusted inwardly to form a hopper bottom extending from the side walls to the outlets, said sections normally lying against and upon the side walls and bottom of the hold whereby increased cargo space may be obtained and the center of gravity of the cargo lowered.

10. In a self unloading conveyor type vessel having a hold with a bottom having a longitudinal outlet through which material is discharged and a substantially flat horizontal bottom between the outlet and a side wall, a wall plate extending longitudinally of a side wall and hinged thereto along its upper edge, said plate when in vertical position against the side wall having its lower edge adjacent the bottom of the hold, a second plate connected to the first plate and resting upon the bottom, said second plate being movable with the first plate when the same is swung inwardly and slidable along the bottom of the hold toward the opening to bridge the space between the lower edge of the wall plate and the bottom of the hold, and means for swinging said wall plate inwardly.

In testimony whereof, I hereunto affix my signature.

HENRY PENTON.