April 29, 1930. L. McMILLAN 1,756,518

CARGO DISCHARGING APPARATUS

Filed Jan. 29, 1929

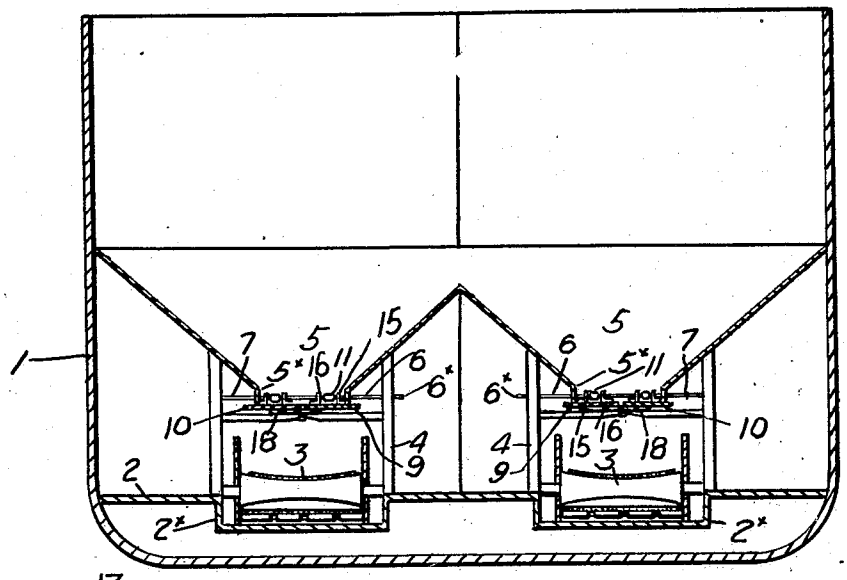


FIG. 1.

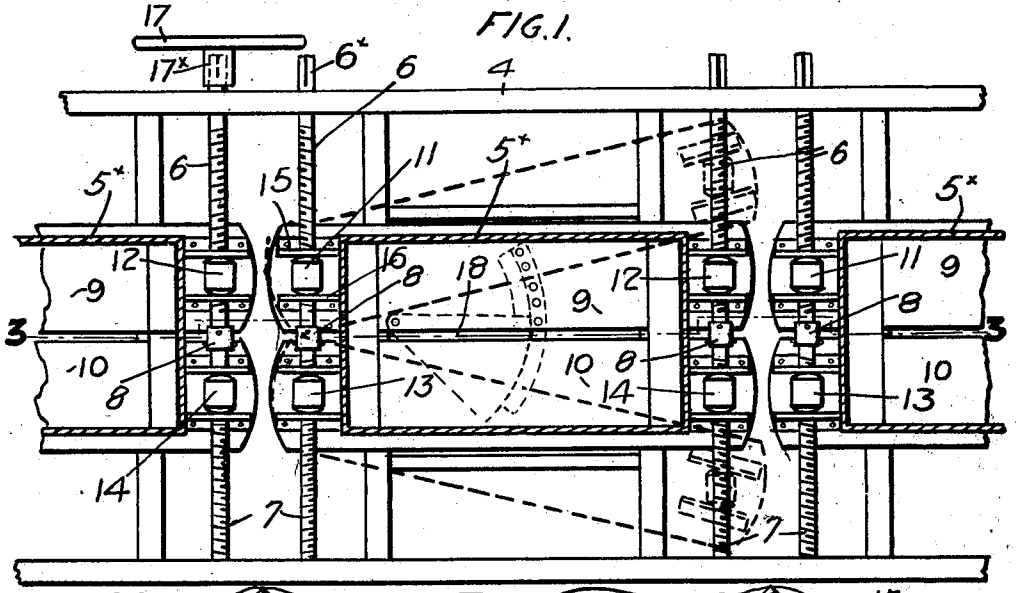


FIG. 2.

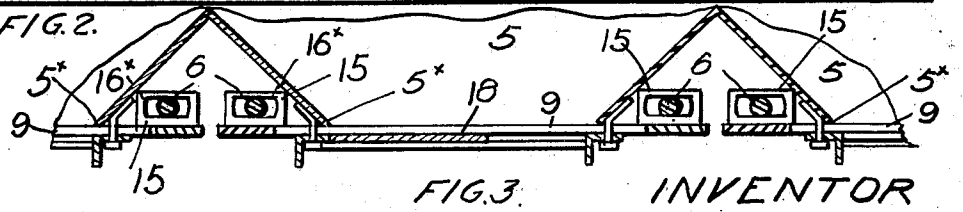


FIG. 3.

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UNITED STATES PATENT OFFICE

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CARGO-DISCHARGING APPARATUS

Application filed January 29, 1929. Serial No. 335,871.

My invention relates to improvements in cargo discharging apparatus, and the object of the invention is to provide an apparatus particularly adapted for the handling of coal and like commodities such as will occupy a minimum amount of space vertically, thereby allowing for a maximum cargo space, and which will provide for an unobstructed flow which will be easily controlled and in which there will be no danger of jamming, and it consists essentially of the arrangement and construction of parts as hereinafter more particularly explained.

Fig. 1 is a cross sectional view through the hull of a vessel showing my discharge apparatus in place therein.

Fig. 2 is an enlarged plan view of a portion of my discharge apparatus showing two of the discharge members in the open or discharge position in dotted lines.

Fig. 3 is a longitudinal sectional view through Fig. 2 on line 3—3.

In the drawing like characters of reference indicate corresponding parts in each figure.

1 indicates the hull of a vessel provided with a horizontal partition 2 forming ballast space in the bottom of the vessel. In this partition are formed channels 2^x on which are mounted longitudinal conveyors 3. These conveyors are of ordinary type and are commonly used for the purpose described.

4 is a framework extending upwardly from the channels 2^x, and 5 are hoppers arranged preferably in pairs transversely of the vessel and extending in series longitudinally of the vessel as indicated in Fig. 2.

5^x are the hopper mouths. At each side of each hopper mouth in the framework 4 are journalled transverse screw spindles each comprising members 6 and 7 reversely threaded one to the other and connected together centrally of the hopper mouth by means of a universal joint connection 8.

9 and 10 are discharge doors extending parallelly in their normal position beneath the hopper mouth, the meeting point between the doors being located centrally of the hopper mouth.

11 and 12 are nuts mounted upon the spindles 6 at each side of the hopper mouth centrally of the door 9, and 13 and 14 are similar nuts screwed upon the spindles 7 also at each side of the hopper mouth and centrally of the door 10.

Secured to the door 9 are a pair of flanges 15 and 16 located at each side of the nut 11, similar flanges being located at each side of the nuts 12, 13 and 14. The flanges 15 and 16 are provided with slotted openings 16^x as indicated in Fig. 3 so as to permit of the swinging movement of each door 9 and 10 about a pivotal centre located at the centre of the nut 11.

Each spindle 6 is provided at its inner end with a squared portion 6^x.

17 is a hand wheel provided with a socket 17^x into which the squared end 6^x of any spindle 6 is adapted to fit, the wheel 17 being removable from spindle to spindle 6 so as to operate any one desired. By turning any one of the spindles 6, such spindle and the spindle 7 connected thereto by the universal joint 8 is turned so as to carry the nuts 12 and 14 in an outward direction or in a direction away from each other, thereby carrying the doors 9 and 10 from the full line position shown in Fig. 2 to the dotted line position shown in the same figure.

By this means a triangular opening is left beneath the hopper mouth so as to allow of coal or other commodity to feed therethrough gradually onto the centre of the belt conveyor 3 to be carried to the discharge hatchway in the ordinary manner.

18 is a plate which is pivotally mounted beneath one of the doors 9 or 10, such plate being substantially triangular in shape and adapted to close the narrow end of the triangular opening formed between the doors 9 and 10 when they are in the open position, thereby preventing any choking of the flow of coal or other commodity in the narrow portion of the opening.

When a certain amount of the coal pressure has been relieved the spindles 6 and 7 at the opposite ends of the doors are operated so as to carry the corresponding ends of the doors 9 and 10 outward into a parallel open position so as to give a freer passage for the flow of commodity therebetween.

When the doors are carried to the open parallel position the plate 18 is swung beneath the door upon which it is pivotally mounted so that the discharge opening between the doors is increased to a maximum.

From this description it will be seen that I have devised a device which will take up a very small vertical space so that it will effect the cargo capacity of the ship to a minimum.

In devices which have hitherto been used the vertical space occupied has been comparatively considerable, and therefore the cargo carrying capacity of the ship has been very seriously affected.

By my device this detriment is entirely overcome, and at the same time I have devised a device in which there will be very little danger of jamming, in which the flow will be unobstructed, and which may be very readily controlled.

What I claim as my invention is:

1. In a cargo discharging apparatus for cargo boats, the combination with a discharge hopper located beneath the cargo space, of a pair of doors located directly beneath the hopper mouth and meeting on the centre line of the hopper, and means for swinging either end of each door outward from the centre line in opposite directions to form a discharge opening beneath the hopper mouth.

2. In a cargo discharging apparatus for cargo boats, the combination with a discharge hopper located beneath the cargo space, of a pair of doors located directly beneath the hopper mouth and meeting on the centre line of the hopper, means for swinging one end of each door outward from the centre line in opposite directions to form a discharge opening beneath the hopper mouth, and a closure plate mounted beneath the doors and adapted to form a removable closure for the narrow end of the discharge opening when the doors at one end are swung to the open position.

3. In a cargo discharging apparatus for cargo boats, the combination with a discharge hopper located beneath the cargo space, of a pair of doors located directly beneath the hopper mouth and meeting on the centre line of the hopper, means manually operable from one side of the hopper for swinging one end of each door outward in opposite directions to form a discharge opening beneath the hopper mouth, and a closure plate mounted beneath the doors and adapted to form a removable closure for the narrow end of the discharge opening when the doors at one end are swung to the open position and adapted to be removed from beneath the discharge opening when the doors are moved to a parallel open position.

4. In a cargo discharging apparatus for cargo boats, the combination with a discharge hopper located beneath the cargo space, of a framework carried beneath the hopper, a pair of doors located beneath the hopper mouth and forming a closure therefor, means for pivotally mounting both ends of each door, and means operated from one side of the hopper for carrying the pivot points of the door outward or inward to carry the door to an open or closed position at either end thereof.

5. In a cargo discharging apparatus for cargo boats, the combination with a discharge hopper located beneath the cargo space, of a framework carried beneath the hopper, a pair of doors located beneath the hopper mouth and forming a closure therefor, a pair of spaced apart slotted flanges extending from the upper face of each door at each side of the longitudinal centre thereof, threaded spindles mounted in the frame and extending through the slots of the door, each formed by members having right and left hand threaded portions, a universal joint connection connecting the inner ends of the threaded members together, and a nut mounted on the right and left hand threaded portion of each member and located between the flanges of the corresponding door.

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