A. MUSKER.

DISCHARGE OF COAL AND THE LIKE CARGO IN BULK FROM BARGES OR VESSELS, AND THE ELEVATION AND DELIVERY THEREOF.

APPLICATION FILED FEB. 12, 1918.

1,309,585.

Patented July 8, 1919.

3 SHEETS—SHEET 1.

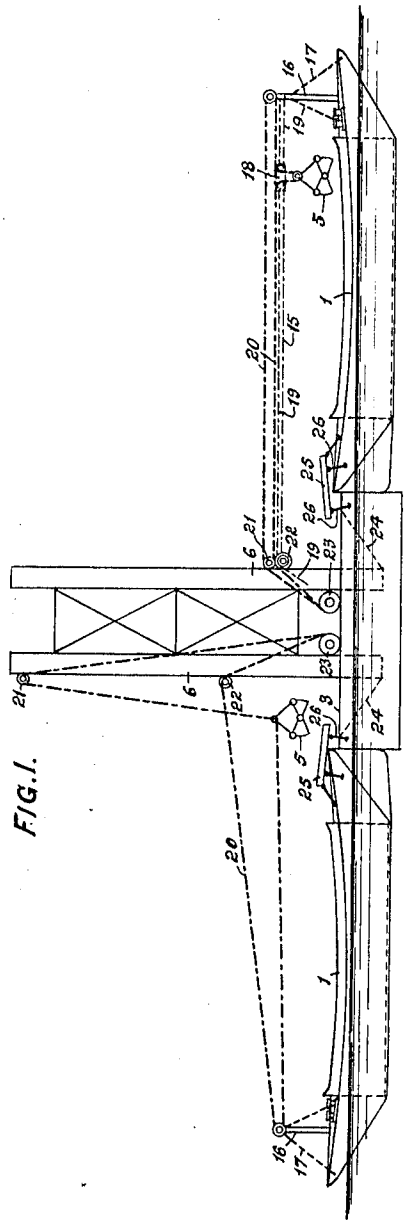


FIG. 1.

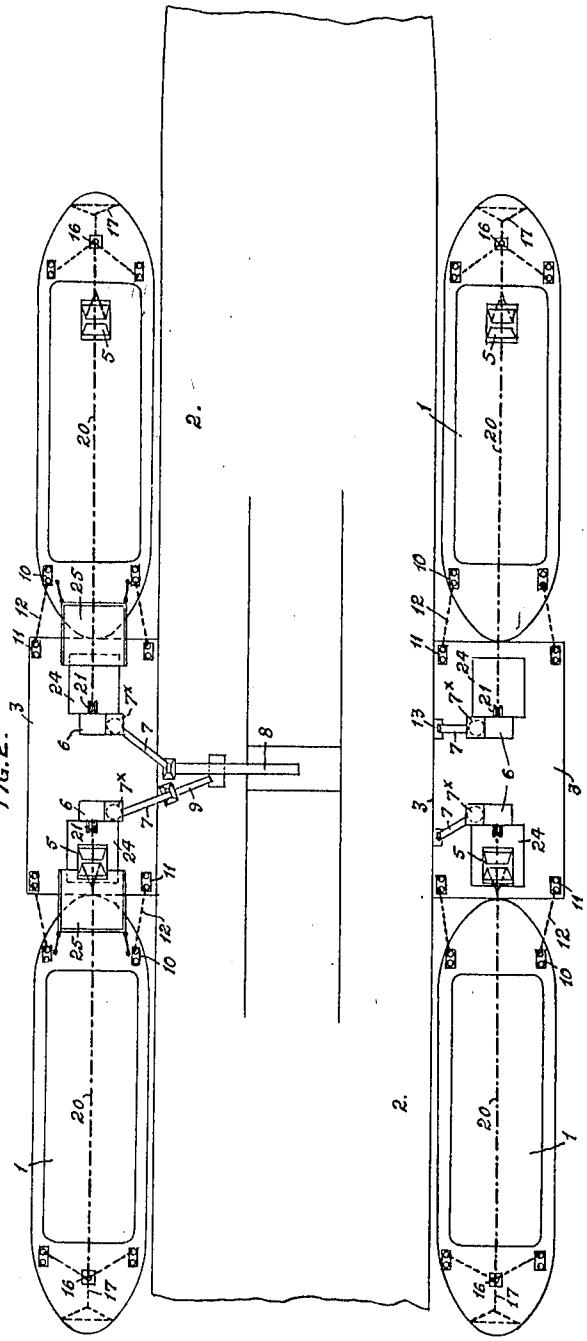


FIG. 2.

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3 SHEETS—SHEET 2.

FIG. 5.

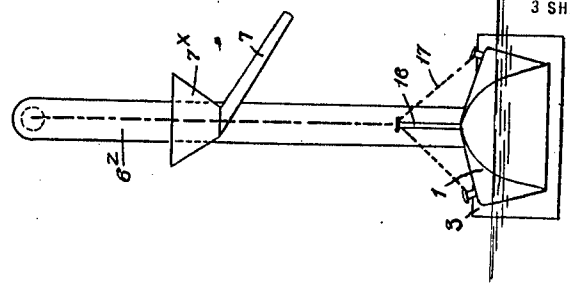
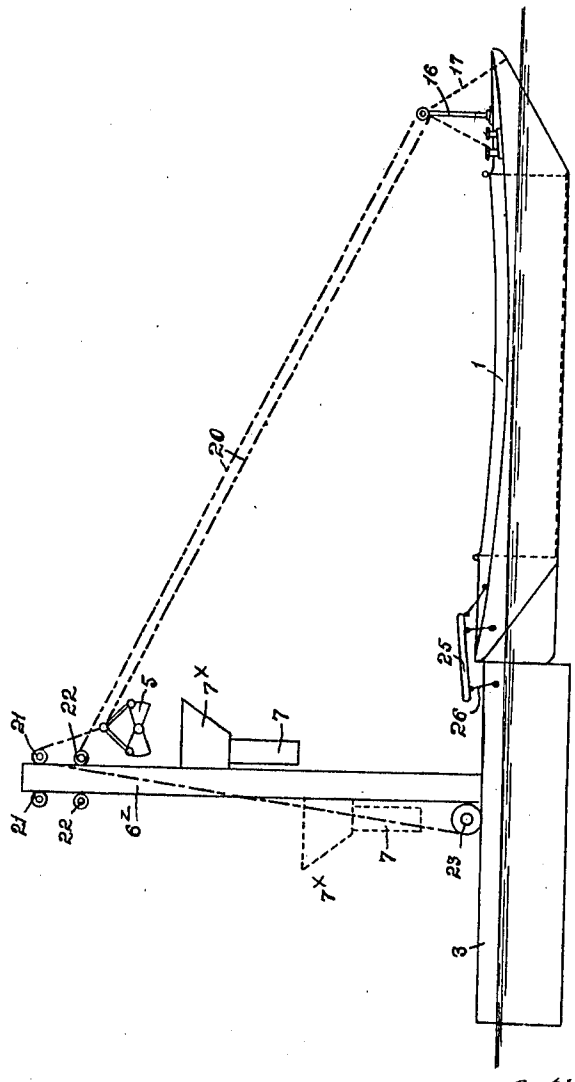


FIG. 4.



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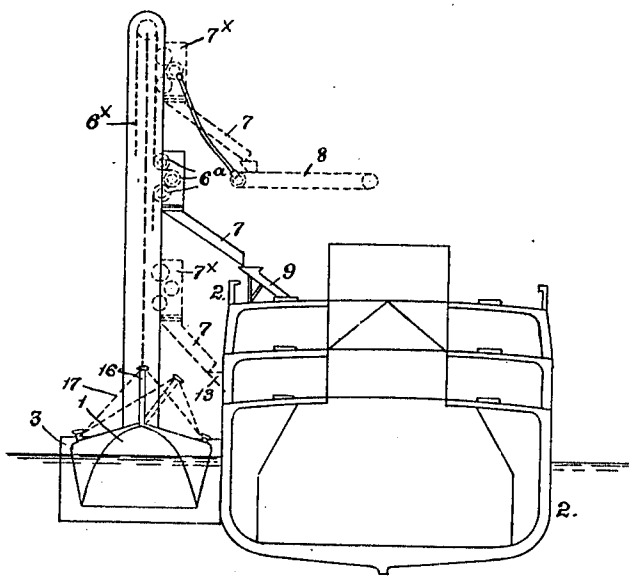
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3 SHEETS—SHEET 3.

FIG. 3.



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UNITED STATES PATENT OFFICE.

ARTHUR MUSKER, OF LONDON, ENGLAND.

DISCHARGE OF COAL AND THE LIKE CARGO IN BULK FROM BARGES OR VESSELS, AND THE ELEVATION AND DELIVERY THEREOF.

1,309,585. Specification of Letters Patent. Patented July 8, 1919.

Application filed February 12, 1918. Serial No. 216,808.

To all whom it may concern:

Be it known that I, ARTHUR MUSKER, a subject of the King of England, residing at London, in the county of Middlesex, England, have invented new and useful Improvements in and Connected with the Discharge of Coal and like Cargo in Bulk from Barges or Vessels, and the Elevation and Delivery Thereof, of which the following is a specification.

This invention has reference to the discharge or removal of coal or like cargo in bulk from barges or vessels, and the elevation and delivery thereof; and it relates to such systems wherein moving or elevating machinery is carried in upon a pontoon or floating vessel, and by means of the machinery, the coal or material is discharged from the barge or barges, and is delivered into a ship or on to a quay or other place of deposit; and one of the chief features of the invention is to provide a system and means of this kind for transferring coal or the like from a barge to a ship or other place of deposit, which shall entail less expense than those at present employed, while at the same time the machinery or means employed shall be simple and easily worked, and with little labor.

The system and means of discharging or emptying coal or the like from barges or vessels, and transferring it to ships or other places of deposit, will be described with the aid of the accompanying drawings which illustrate it, while as regards the characteristics claimed as novel in respect of the invention, these are set out in the claiming clauses of the statement of claim concluding the specification.

In the drawings, Figure 1 is an elevation, and Fig. 2 a plan, and Fig. 3 an end elevation showing elevators and gearing carried on a vessel or pontoon, barges from which material is to be removed, and a ship into which the material from the barges is to be delivered. Figs. 4 and 5 are side elevation and end view showing a modification.

In the drawings and more particularly in Figs. 1 to 3, 1 represents the barges from which the material in bulk is to be discharged; 2 is a ship alongside of which the barges 1 are laid, and which is to receive the goods from the barges; and 3 generally represents a machinery carrying vessel or pontoon *i. e.* one carrying gearing elevators by which the material from the barges is taken and delivered into the ship, and bucket grab, or like operating tackle or gear.

The barges 1 containing the coal or cargo in bulk, in carrying out the system, are disposed end on and secured to the end of the machinery carrying pontoon or vessel 3; and the material is delivered from the barges, mechanically and automatically endwise, by a tackle or mechanical means hereinafter described, extending between the machinery pontoon 3, and the end of the barge farthest therefrom; and it is taken and delivered by an automatic grab or the like, marked 5 in the drawings, which is operated by the tackle longitudinally and otherwise, and discharges its contents into the pontoon or vessel 3 (or otherwise as hereinafter described), whence it is taken by elevators 6 in the pontoon 3, and thereby lifted up and subsequently discharged into a chute 7, or a chute 7 and conveyer 8 shown in dotted line in Fig. 3, by which it is conducted to the ship 2.

As will be seen in Fig. 1, the machinery pontoon or vessel 3 has two sets of elevators 6, and automatic lifting and discharging mechanism or tackle; and the two barges 1 are arranged to lie in line with same or at a suitable angle, on its opposite ends, and to deliver the goods to the respective elevators; the vessel 3 being normally secured to the ship and the barges secured to the vessel 3. The means of securing the barges endwise on to the machinery pontoon 3 will be by a species that while it keeps the distance and relative positions practically constant, it enables the barge to rise as it is discharged. For instance, in the case shown, the barges 2 have mooring bollards or the like 10 one on each side, near the bow, and the pontoon 3 has similar bollards 11 at each angle, and ropes, chains or the like 12 are

made fast to these bollards or devices 10 and 11. This enables this relative movement or rising of the barge as discharged to take place. Or in lieu of this means, links secured at each end by free joint connections to the barge and the pontoon, may be employed.

In some cases, as shown in Figs. 1 to 3, the elevators are shown discharging into spouts 7 and then on to elevators 8, see Figs. 2 and 3, which may deliver the material through the center hatches of the ship. These figures also show an elevator discharging into a chute 7, delivering the material into a chute 9 on to the ship decks, which leads into a hatch toward the side of the ship.

On the opposite side of the ship to that just referred to, as seen in Fig. 2, the elevators 6 are shown adapted to deliver the material to the chute 7, which conducts it into hoppers 13 on the side of the ship. Fig. 3 shows all these different points of delivery, and to enable the general deliveries to be carried out, the receiving boxes 7^x of the elevators, to which the spout 7 is connected, and to which the elevators discharge the material, have within them a plurality of rollers 6^a, under and over which the bucket chain 6^x of the elevator passes, and these—the boxes—are adapted to slide up and down on the case of the elevator, so that it can be fixed at any height suitable for discharging in any of the modified ways or to the different points, as referred to.

The movement up or down of the box 7^x can be effected by spragging one of the wheels 6^a by a suitable pin or device (the axes of the wheels being all on the box), when by moving the elevator chain 6^x up or down, the box 7^x will be moved up or down; and when it is so moved, the box may be fixed by bolts or any other means to the casing of the elevator, when the sprag is removed, and then the elevator will be in its normal condition, and can be worked as usual.

With regard to the tackle for removing material from the barge 1, and delivering it to the machinery pontoon 3, in Figs. 1 to 3 the appliance 5 consists of a grab bucket, and in the arrangement shown on the right hand side of Fig. 1, it is supported on a chain or rope 15 fixed at one end to a short mast or post 16 on the outer end of the barge 1, being suitably stayed by guys 17.

The bucket is supported on the rope way 15 by a carriage 18, having suitable rollers in it, over which works a chain 19 or rope, which is fastened at one end to the pole 16, and passes down to the bucket over a pulley, and up and to the operating machinery at 23, and thus it can be lowered into the barge, closed, and elevated and take in a bucket-full of material, in any of the well-known ways. The bucket is moved longitudinally by a chain or rope 20 fastened at both ends to the carriage 18, and passing over a pulley on the head of the post 16, and over pulleys 21 and 22 on the elevator, whence it passes down to the winding barrels 23, which will be provided with suitable operating motors; and by means of this rope or chain, the bucket can be moved to and fro along the suspending rope way 15; and when it is brought over the well 24 of the pontoon 3, in the bottom of which the lower end of the elevator 6 stands, it is caused to discharge its contents; and the bottom of this well 24 being inclined, the material automatically passes to the elevator.

Between the end of the barge 1 and the well 24, there is a platform 25 supported on links 26, and suitable guys, which prevents any material from dropping down between the barge and the pontoon; but it enables relative vertical movement between the barge and the pontoon.

It will be seen that this transporter grab 5, adapted to work as described, commands and works over the whole of the hold of the barge from end to end; and that moving of the barge in relation to the pontoon, as it is discharged or emptied, is not required; and by altering the inclination of the post 16 as shown in Fig. 3, the line along which the bucket travels or traverses, can be made to be one toward the sides, as well as along the center of the barge.

In some cases, instead of rope or chain tackle such as described being used for the purpose of supporting or carrying the bucket, a portable transporter boom taking the position of the rope way 15, and tackle, may be employed; and when such a gear is used, the boom may be connected to the elevators 6, but need not be connected to the barge, it being supported from the upper part of the elevator 6 by a rope or the like, say in about the position of the rope 20.

In the arrangement on the left hand side in Fig. 1, the drag bucket 5 is supported and moved longitudinally by the chain or rope 20, which is connected to the bucket and passes over the pulley on the post 16, and also the pulleys 21, 22, on the elevator casing 26, and by means of this rope 20 it is moved from end to end of the barge, and discharged into the hopper 3, and discharged into the well 24 of the pontoon 3. The opening and closing of the bucket 3 will be effected by a chain or chains passed over pulleys and led to the operating machinery at 23 in any of the well-known ways.

The barges shown in Figs. 1 to 3 are supposed to be of the ordinary existing type of barges without modification alteration; and in such cases the transporter grab bucket tackle shown and described is advantageous, as it can move and operate over the bulk of coal or other cargo over the whole length of

the barge directly; that small portion which the grab cannot pick up being put into the grab bucket by hand in the usual way.

When a drag-bucket—which may be of any known suitable kind—is used for discharging the coal or material from a barge, it will be dragged along the barge lengthwise or operated by a rope or chain tackle in the known way, the rope or chain tackle being of course arranged at the required elevation, and secured at its outer end to the stanchion or post 16; and in this case the barge will be sloped at the end which comes next the pontoon 3, so that when the drag bucket comes to this part, it will drag the coal up the slope, and deliver it into the receiving pit 24 of the elevator pontoon.

New barges may be made in this form, or existing ones may be converted or modified so as to act as described.

When a barge is emptied, the grab or drag bucket tackle and gear are disconnected and removed from the barge, and moved on to the pontoon 3; and when a fresh barge is fixed in position, they are replaced as before.

By this system and means, the objects above referred to are accomplished, and the cost of working is low; and they render the working easy, as the barges have not to be moved when being emptied; and little or no hand labor is required. Furthermore, an elevator and its pontoon and barges can be used on each side of a ship, when supplying a ship with coal or the like, without taking up more room than the width of the pontoon, which when a ship is near the quay is very advantageous.

As a modification a special vessel or barge may be used, which would serve both to carry the cargo in bulk, and have an elevator 6 on one end of it; and the gear or tackle as above described, extends along it and over its hold; and, if desired, the elevator mast can be made with a hinge or to telescope, so that it can be lowered when required; and in the case of gearing being operated by electric motor or motors, current can be obtained from the ship being loaded or from the shore.

In such a case, if desired, an ordinary barge such as described, may be brought end to end with that carrying the elevator and gearing, and secured to the same by means as described; and to discharge this barge a tackle such as described, secured to and worked from the elevator and its mechanism will be arranged over it, so that the one elevator will deal with and empty two barges or vessels.

According to a further modification, the elevation of the material, as well as its conveyance longitudinally over the barge, may be effected by a grab bucket and chain or rope tackle, as illustrated in Figs. 4 and 5. In this case, the pulleys 21, 22, over which the rope or chain 20 connected with the grab bucket 5, passes, will be carried by a mast 6^z, and the boxes which receive the material from the elevating means, will be mounted on this mast, one on each side, and this means in this case is the buckets themselves, so that the material discharged by the buckets falls directly into them, and is led by the spout 7, and delivered to the part of the ship required. These boxes and spouts are adjustable vertically on the pontoon on the mast 6^z, as in the case described with reference to Figs. 1 to 3.

What is claimed is:—

1. In apparatus for transferring material from barges to a ship, a pair of barges arranged near and upon one side of the ship and arranged in spaced end to end relation with each other, a hoisting vessel arranged between the inner ends of the barges, flexible means connecting the inner ends of the barges and the hoisting vessel, conveyers connected with the hoisting vessel and extending longitudinally of the barges to points near their outer ends to conduct material from the barges to the hoisting vessel, and hoisting mechanism carried by the hoisting vessel and extending above the same to discharge the material into the ship.

2. In apparatus for transferring material from barges to a ship, a pair of barges arranged upon the side of the ship in substantially parallel relation thereto, said barges being arranged in end to end relation and having their inner ends spaced, a hoisting vessel arranged between the inner ends of the barges, flexible means connecting the inner ends of the barges and the hoisting vessel, platforms having flexible connections with the inner ends of the barges and the hoisting vessel and arranged above the same to span the space between them, said platforms being inclined and extending downwardly toward the hoisting vessel to conduct material upon the same, conveyers connected with the hoisting vessel and extending longitudinally of the barges to points near their outer ends to conduct material from the barges to the hoisting vessel, and hoisting mechanism carried by the hoisting vessel and extending above the same to discharge the material into the ship.

3. In apparatus of the character described, a barge arranged upon one side of a ship, a hoisting vessel arranged upon the same side of the ship and having flexible connection with one end of the barge, a post connected with the outer end of the barge, a support carried by the hoisting vessel, a pulley carried by the support, a cable connected with the post and passed about the pulley, a drum carried by the hoisting vessel and connected with the cable to wind and unwind the same, so that the cable may be lowered

and raised with relation to the barge, a carriage to travel upon the cable, a receptacle connected with the carriage and extending below the same, means to effect the longitudinal travel of the carriage, and hoisting mechanism arranged upon the hoisting vessel.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ARTHUR MUSKER.

Witnesses:

ARTHUR ROBERT THOMAS WOODS,
LOUISE MAUD ROBINSON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."