

T. S. MILLER.
 APPARATUS FOR TRANSFERRING MATERIALS.
 APPLICATION FILED JUNE 25, 1908.

1,013,420.

Patented Jan. 2, 1912.
 4 SHEETS—SHEET 1.

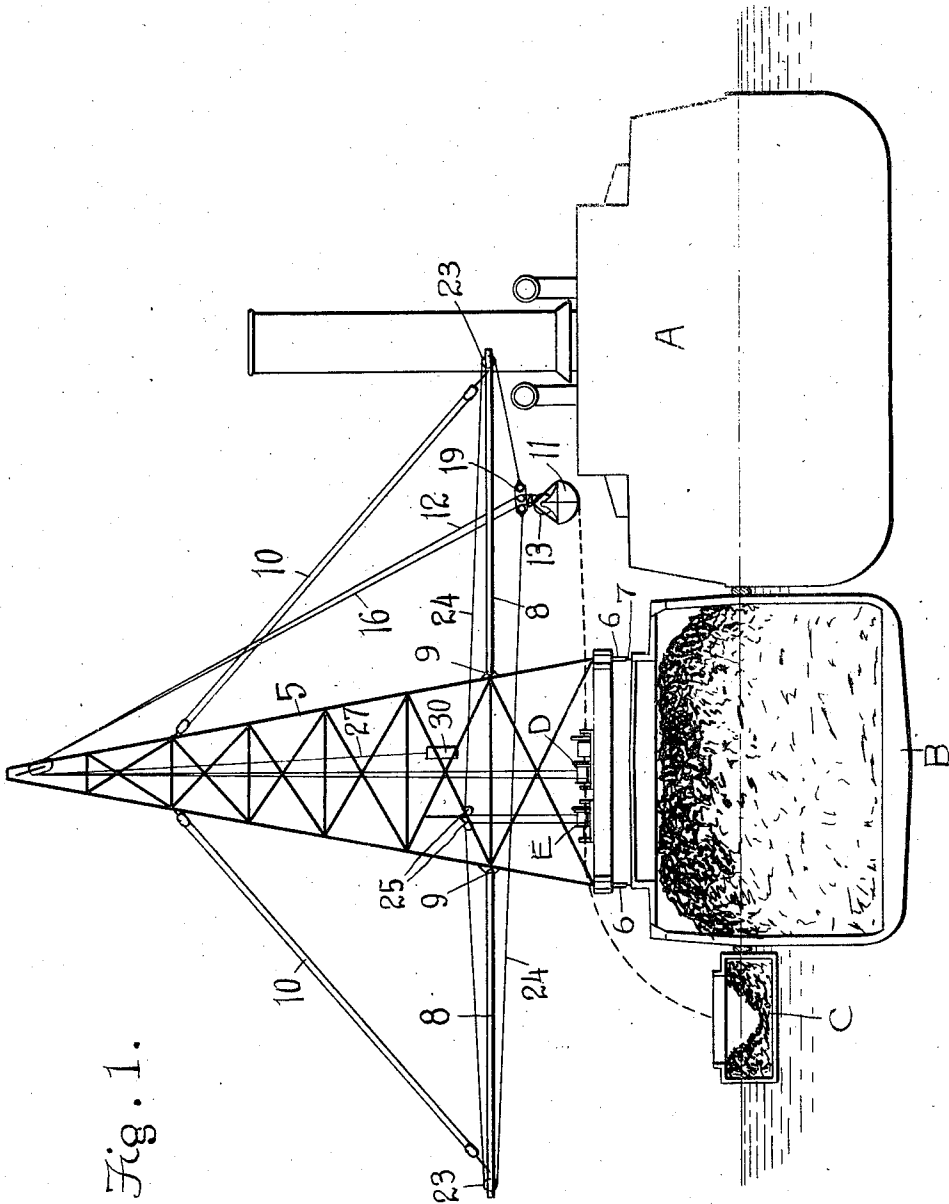


Fig. 1.

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Fig. 5

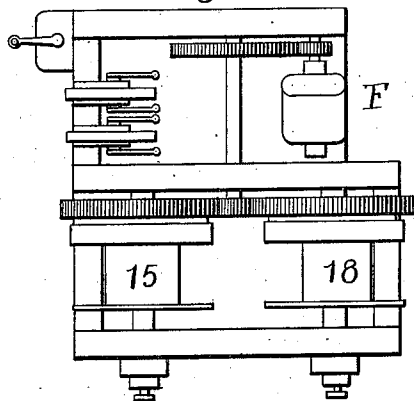


Fig. 4

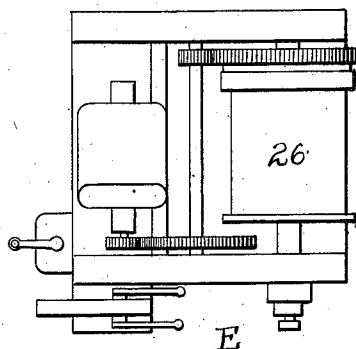
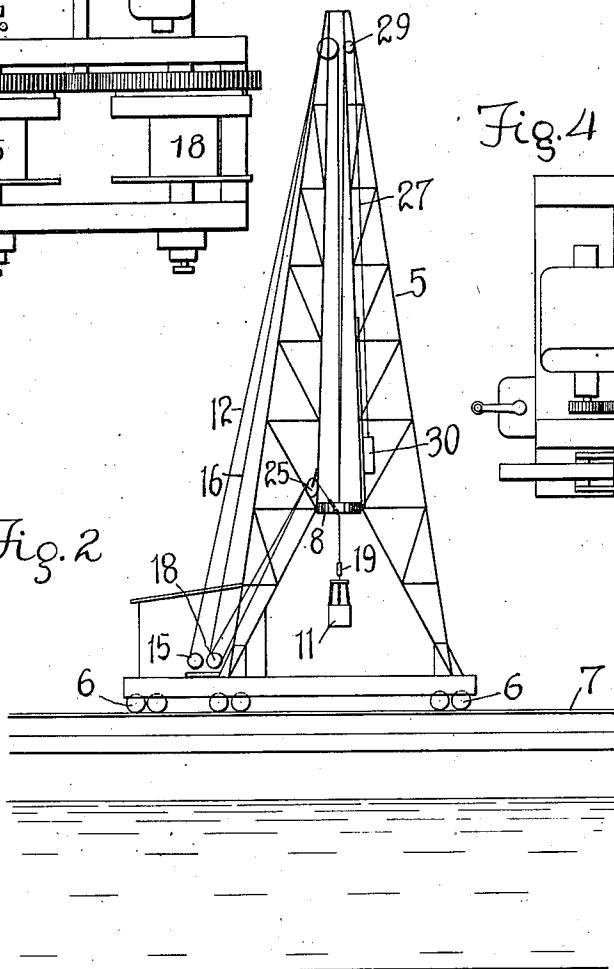


Fig. 2



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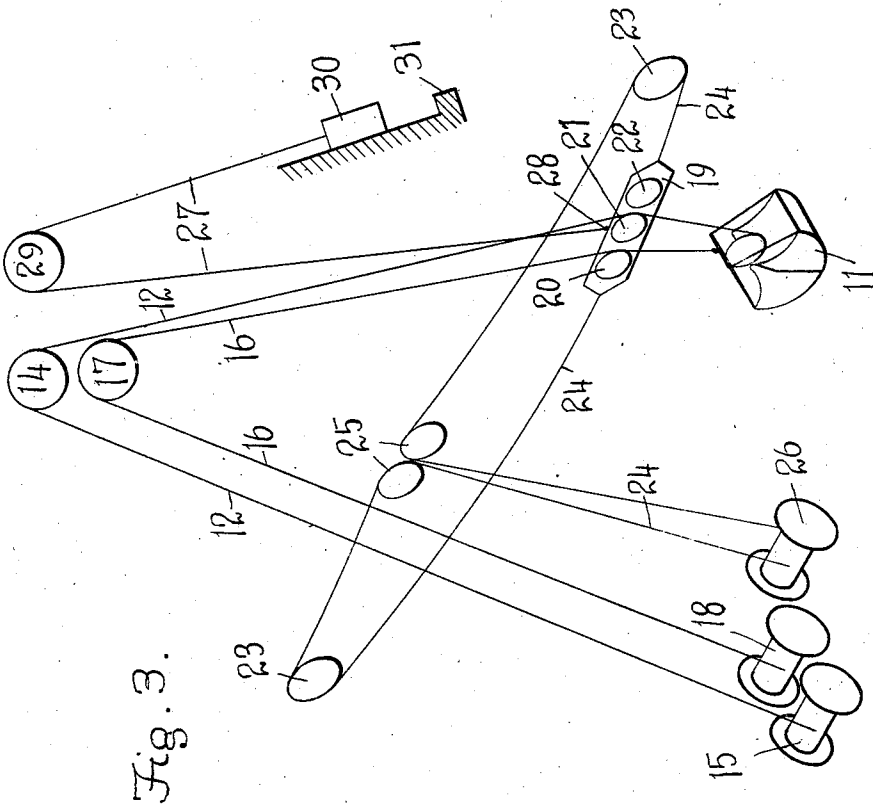
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4 SHEETS—SHEET 4.

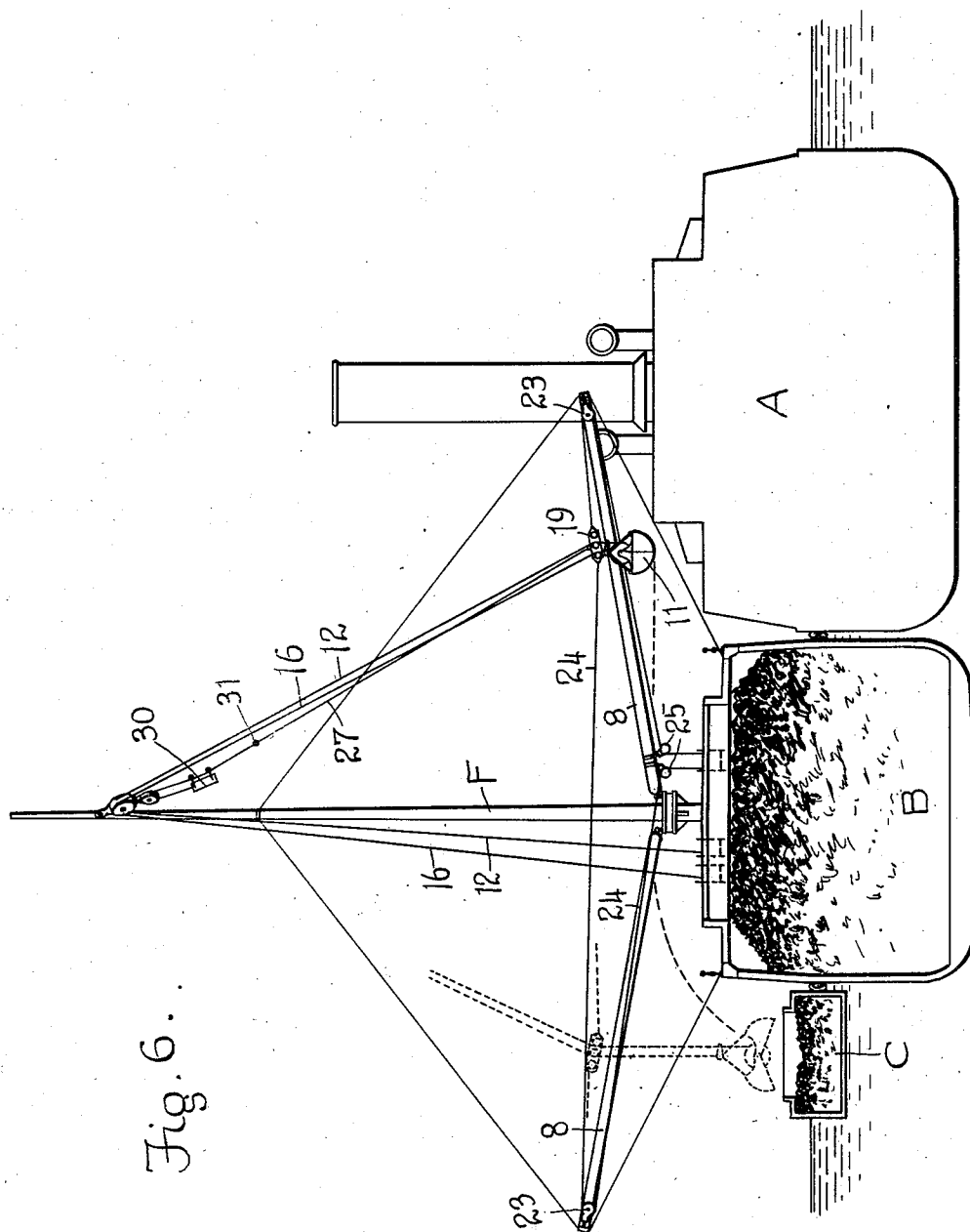


Fig. 6.

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UNITED STATES PATENT OFFICE.

THOMAS SPENCER MILLER, OF SOUTH ORANGE, NEW JERSEY.

APPARATUS FOR TRANSFERRING MATERIALS.

1,013,420.

Specification of Letters Patent.

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Application filed June 25, 1908. Serial No. 440,242.

To all whom it may concern:

Be it known that I, THOMAS SPENCER MILLER, a citizen of the United States, and a resident of South Orange, county of Essex, and State of New Jersey, have invented certain novel and useful Improvements in Apparatus for Transferring Materials, of which the following is a specification.

This invention relates to apparatus for handling and transferring materials in bulk, such as coal or other masses of material, and in the present instance, I have shown, by way of illustration, my invention as applied to the handling of coal and the transferring of the same from one vessel to another; although I wish it to be understood that I do not limit myself to the particular use which for the purposes of an understanding of the invention, I have herein shown and described.

The invention consists in the construction, combination and arrangement of parts set forth in and falling within scope of the appended claims.

In the accompanying drawings, Figure 1 is a cross-sectional view taken through a collier or coal-supply station, and showing the transference of a cargo from a barge alongside the coal station to a battleship on the opposite side of the station. Fig. 2 is a view of the traveling support or tower carrying the hoisting and transferring apparatus. Fig. 3 is a diagrammatic view, illustrating the various leads of rope of the hoisting and transferring apparatus. Fig. 4 is a top plan view of engine for hoisting and opening and closing the bucket. Fig. 5 is a similar view of the swinging or transferring engine which is employed to convey or swing the bucket to the point where it is to be dumped. Fig. 6 is a cross-sectional view similar to Fig. 1, but showing my invention as applied to a sea-going collier, in this instance, having a mast or masts thereon, for the support of the hoisting gear, instead of the traveling tower shown in Fig. 1.

Referring now to the accompanying drawings in detail, A designates a battleship, to be coaled; B indicates a coal-supply station, in the present instance in the nature of a vessel or barge adapted particularly for harbor work, and C indicates an ordinary coal barge adjacent to the coal station, such view illustrating the conveyance of the material from the barge C across the station B to the battleship A, the apparatus being

located upon the station B. Such an operation is desirable where the coal may be conveniently obtained, and it is not desired to transfer the coal from the supply station or collier direct to the battleship.

Mounted upon the station B is a movable or traveling tower 5, having wheels 6 resting on tracks or rails 7, so that the tower may be moved longitudinally of the station as desired. Extending in opposite directions and from opposite sides of the tower are the booms 8, suitably pivoted as at 9 to the tower, and provided with the ordinary stays or guys 10, so that the booms may be adjusted at the desired elevation.

11 indicates a grab bucket, in the present instance shown as of the clam shell type, although it is to be understood that such bucket may be of any desired sort. This bucket is hoisted, opened and closed by means of the rope 12 operating the power wheel 13 of the bucket, said rope 12 passing from the bucket up and over the sheave 14, suitably connected to the support, and thence such line passes downward and around the drum 15 of the engine D. The holding rope 16 of the bucket passes up and over the sheave 17, thence down to the drum 18 of the engine D. By these ropes 12 and 16 the bucket is opened and closed, hoisted and lowered.

19 designates a swinger block or trolley carrying the sheaves 20, 21 and 22 between which the ropes 12 and 16 pass. This swinger block is designed to be moved horizontally to deliver or take a load off either side of the station. To accomplish this, I locate at or near the ends of the booms 8 a sheave 23, and connect to the opposite ends of the block 19 the swinger ropes 24, these ropes passing around the sheaves 23, thence toward the center of the station or collier, around the sheave 25, and thence down to the drum 26 of the swinger engine E. The swinger block or floating trolley is suspended from the tower or support by a pendulum rope 27, secured at one end, as at 28, to the block, thence passing over the sheave 29 at the tower or mast, the opposite end of said pendulum rope being attached to a counterweight or tension device 30, said weight being slightly in excess of the weight of the floating trolley or swinger block.

31 designates a stop suitably located on the pendulum rope, as in Fig. 6 and on side of tower in Fig. 3 so that the weight is prevented dropping so low as to hoist the float-

ing trolley above an approximately straight line drawn from the pulleys at the outboard end of the booms. The employment of the weight in conjunction with this pendulum rope also enables me to take up any slack in the pendulum rope, and therefore have the trajectory of the bucket approach as nearly as practicable a straight line. This enables me to employ a tower or mast of considerably less height than would otherwise be necessary.

From the above description, taken in connection with the drawings, the construction and operation of my apparatus will be readily apparent. When the bucket comes out of the hold with a load, it is elevated sufficiently by the operator at the engine D to clear the hatch coamings and to touch the floating trolley. In hoisting the bucket from the hold, the operator uses the hoisting drum 15, slack being also taken in on the line 16 by the drum 18. When the bucket strikes the floating trolley, it is ready to be swung horizontally to the point of deposit, and this is accomplished by an operator at the engine E operating the drum 26, the operator at the engine D paying out the lines 12 and 16 sufficiently to permit the outward traveling of the bucket. When the bucket has reached the point of deposit, the drum 26 is stopped, the bucket is held by holding on the line 16 through the drum 18 and such bucket is dumped by paying out the line 12. To swing the bucket back, the bucket is hoisted somewhat and returns in a trajectory approaching nearly a straight line.

Under ordinary conditions, my apparatus permits the coaling of a ship or the transferring of material in bulk with ease and rapidity. In the case of coaling in smooth water, where the apparatus is adapted for use upon a collier, I may substitute, in place of the traveling tower, a stationary or permanent mast F, such as is shown in Fig. 6, but otherwise the apparatus employed may be the same.

Although I have in the foregoing specification described a complete equipment for the continuous handling of material in bulk, I do not wish to limit myself to the use of the whole apparatus, since I am aware that my invention embodies different parts, which are capable of several as well as joint use, and each and all of which I intend to claim.

Having thus described my invention, what I claim is:

1. The combination of a supply station, an elevated support thereon, a hoisting-rope sheave connected to the support, a hoisting drum adjacent to the support, a hoisting rope leading from said drum over said hoisting rope sheave and thence downward, a floating trolley or swinger block, a pendu-

lum rope from which said block is suspended, a take-up for said pendulum rope, two booms extending in opposite directions from the support, a rope sheave at the end of each boom, two swinger ropes leading from winding mechanism over said sheaves at the boom ends and secured to said swinger block or floating trolley, whereby said hoisting rope may be swung across the supply station.

2. The combination of a support, a load carrier, a hoisting rope therefor, a hoisting rope actuator, an elevated hoisting rope sheave, an elevated hoisting rope swinger frame, a pendulum rope for supporting said swinger frame, a weight constituting a take-up for said pendulum rope, and swinger ropes connected with said swinger frame and extending in opposite directions from said hoisting rope.

3. The combination of an elevated support, a load carrier, a hoisting rope for said load carrier, means other than the hoisting rope for swinging said carrier in opposite directions in an approximately horizontal path, means whereby the hoisting rope is freely movable at all times longitudinally of itself relative to the swinging means, a pendulum rope connected to the means for swinging the carrier, and a take-up for the pendulum rope.

4. The combination of a support, two booms extending from said support, a hoisting rope, a load carrier connected thereto, a floating swinger frame for swinging the load carrier, oppositely directed ropes for positively swinging the swinger frame in opposite directions and counterbalancing means for controlling said swinger frame to cause the load to travel in an approximately straight path between the ends of the booms.

5. In combination, a supply station, a movable support thereon, a load carrier, means for hoisting the load carrier, a swinger frame, a pendulum rope therefor, a take-up device for the pendulum rope, and means for limiting the movement of the take-up device.

6. In combination, a supply station, a support thereon, a load carrier, means for hoisting the load carrier, a swinger frame, a pendulum rope therefor, a weight for the pendulum rope and a stop for said weight.

7. In combination, a hoisting rope, an actuator therefor, an elevated hoisting rope sheave, a swinger frame, swinger ropes connecting said swinger frame and extending laterally in opposite directions, a pendulum rope whereby said swinger frame is suspended and supported from an elevated point during its swinging movements, and a tension device for said pendulum rope.

8. In combination, a hoisting rope, an

actuator therefor, an elevated hoisting rope sheave, a swinger frame, swinger ropes connected with said swinger frame and extending laterally in opposite directions, a pendulum rope by which said swinger rope is suspended from a point adjacent to said elevated hoisting rope sheave, a weight for said pendulum rope and a stop for said weight.

9. In combination, a movable support or tower, a load carrier, a hoisting rope therefor, an actuator for the hoisting rope, a swinger frame engaging the fall of the hoisting rope, swinger ropes connected with said swinger frame and extending in opposite directions, an actuator for said swinger ropes, a pendulum rope by which said swinger frame is suspended from an elevation, a tension device for the pendulum rope, and means whereby the elevation of the pendulum rope is limited to retain the movement of the swinger frame in a predetermined horizontal path.

10. The combination of a support, booms projected in opposite directions from the support, a pendulum rope suspended from the support at a point above the booms, a load-swinger supported by the pendulum rope, a rope traversing the booms for moving the load-swinger transversely of the support, hoisting means for the load engaged by the load-swinger, and a counterbalance for the load-swinger connected to the pendulum rope.

11. The combination of a support, booms projected in opposite directions from the support, a pendulum rope suspended from the support at a point above the booms, a load swinger supported by the pendulum rope, means carried by the booms for moving the load-swinger transversely of the support, a load-carrier movable with the said load-swinger, hoisting means for raising and lowering the load-carrier, and a counterbalance for the load swinger connected to the pendulum rope.

12. The combination of a support, a pendulum element suspended at an elevated point on said support, a load swinger supported by the pendulum element and movable therewith transversely of the support, to points on opposite sides of the point of suspension, means for imparting the transverse movement to the load swinger, means for hoisting the load, and a counterbalance for the load swinger connected to the pendulum element.

13. The combination of a support, a pendulum element suspended at an elevated point on said support, a load swinger supported by the pendulum element and movable therewith transversely of the support to points on opposite sides of the point of suspension, means for imparting the transverse movement to the load swinger, means for raising and lowering the load, and means

for regulating the length of the pendulum element according to the position of the load swinger relative to the point of suspension of said pendulum element.

14. The combination of a support, a load carrier and hoisting rope therefor, a pendulum element suspended at an elevated point on said support, a load swinger supported by the pendulum element and movable therewith transversely of the support to points on opposite sides of the point of suspension, said swinger engaging the hoisting rope, and means for regulating the length of the pendulum element.

15. In combination, a hoisting-rope; an actuator therefor, an elevated hoisting rope sheave, a swinger-frame engaging the fall of said hoisting rope, swinger ropes connected with said swinger-frame and extending laterally from said fall in opposite directions, and a pendulum rope by which said swinger-frame is suspended from a point adjacent to said elevated hoisting rope sheave, and means connected to the pendulum rope for counterbalancing the swinger frame.

16. In combination, a hoisting rope, an actuator therefor, an elevated hoisting rope sheave, a swinger-frame engaging the fall of said hoisting rope, swinger ropes connected with said swinger-frame and extending laterally from said fall in opposite directions, a pendulum rope by which said swinger frame is suspended from an elevation, a counterbalance on the pendulum rope, and guide wheels for said hoisting rope mounted on the swinger-frame.

17. Machinery for handling coal, etc. comprising a vertical support, oppositely disposed gaffs carried thereby, guide sheaves at the extremities of said gaffs, a horizontal traverse rope passing over said sheaves, a flying trolley supported and moved horizontally by said horizontal traverse rope, a guide sheave carried by said support above the trolley, a hoisting rope passing over said last-named guide sheave and through said trolley to be moved horizontally therewith to one side or the other, a pendulum rope connected to the trolley and passing over a sheave on the support above the path of the trolley and a counter-balance on said pendulum rope.

18. In combination, a hoisting rope, a swinger-frame engaging the fall thereof, an out-haul swinger rope, an inhaul swinger rope, a swinger frame suspender rope, and a counterbalance for the frame operating on said suspender rope.

19. In a marine transfer, in combination, a boat having a hatchway, a hoisting rope sheave above the hatchway, outhaul and inhaul swinger rope sheaves, a swinger frame, a hoisting rope extending therethrough, the outhaul and inhaul swinger ropes, means

for actuating the same, a suspender rope and a counterweight for the same.

20. In a marine transfer, in combination, a boat having a hatchway, a hoisting rope sheave above the hatchway, outhaul and inhaul swinger rope sheaves, the swinger frame, the hoisting rope extending there-through, the outhaul and inhaul swinger

ropes, means for actuating the same, a suspender rope, a counterweight for the same, 10 and a stop whereby the fall of said counterweight is arrested.

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Witnesses:

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